

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Susumu KOBAYASHI et al.

Serial No. NEW

Filed July 24, 2001

COPY

Attn: Application Branch

Attorney Docket No. 2001\_1035A

A SYSTEM FOR TRANSMISSION/RECEPTION  
OF E-MAIL WITH ATTACHED FILES

THE COMMISSIONER IS AUTHORIZED  
TO CHARGE ANY DEFICIENCY IN THE  
FEE FOR THIS PAPER TO DEPOSIT  
ACCOUNT NO. 23-0975.

CLAIM OF PRIORITY UNDER 35 USC 119

Assistant Commissioner for Patents,  
Washington, DC 20231

Sir:

Applicants in the above-entitled application hereby claim the date of priority under the International Convention of Japanese Patent Application No. 2000-223058, filed July 24, 2000, as acknowledged in the Declaration of this application.

A certified copy of said Japanese Patent Application is submitted herewith.

Respectfully submitted,

Susumu KOBAYASHI et al.

COPY

By

Michael S. Huppert #33142  
for Michael S. Huppert  
Registration No. 40,268  
Attorney for Applicants

MSH/kjf  
Washington, D.C. 20006-1021  
Telephone (202) 721-8200  
Facsimile (202) 721-8250  
July 24, 2001

BEST AVAILABLE COPY

日本国特許庁  
JAPAN PATENT OFFICE

別紙添付の書類に記載されている事項は下記の出願書類に記載されて  
いる事項と同一であることを証明する。

This is to certify that the annexed is a true copy of the following application as filed  
with this Office

出願年月日  
Date of Application:

2000年 7月24日

出願番号  
Application Number:

特願2000-223058

出願人  
Applicant(s):

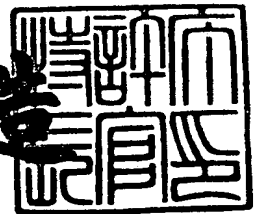
松下電器産業株式会社

CERTIFIED COPY OF  
PRIORITY DOCUMENT

2001年 6月25日

特許庁長官  
Commissioner,  
Japan Patent Office

及川耕造



出証番号 出証特2001-3059814

【書類名】 特許願

【整理番号】 2032720024

【提出日】 平成12年 7月24日

【あて先】 特許庁長官 殿

【国際特許分類】 G06F 13/00  
G06F 13/351  
H04L 11/20

【発明者】

【住所又は居所】 大阪府門真市大字門真 1 0 0 6 番地 松下電器産業株式  
会社内

【氏名】 小林 進

【発明者】

【住所又は居所】 大阪府門真市大字門真 1 0 0 6 番地 松下電器産業株式  
会社内

【氏名】 大村 猛

【発明者】

【住所又は居所】 大阪府門真市大字門真 1 0 0 6 番地 松下電器産業株式  
会社内

【氏名】 中西 正典

【発明者】

【住所又は居所】 東広島市鏡山 3 丁目 1 0 番 1 8 号 株式会社松下電器情  
報システム広島研究所内

【氏名】 澄田 哲二

【発明者】

【住所又は居所】 東広島市鏡山 3 丁目 1 0 番 1 8 号 株式会社松下電器情  
報システム広島研究所内

【氏名】 植田 栄治

【特許出願人】

【識別番号】 000005821



# VERIFICATION OF TRANSLATION

I, Tomoko Hara, translator of 6F, Yodogawa 5-Bankan, 3-2-1, Toyosaki, Kita-ku, Osaka, Japan, hereby declare that I am conversant with the English and Japanese languages and am a competent translator thereof. I further declare that to the best of my knowledge and belief the following is a true and correct translation made by me of the English translation of Japanese Patent Application No. 2000-223058 filed to the Japanese Patent Office on July 24, 2000.

Date: February 9, 2007

原 明子

TOMOKO HARA

[DOCUMENT] Patent Application

[OUR REFERENCE NO.] 2032720024

[FILING DATE OF APPLICATION] July 24, 2000

[To] Commissioner, Patent Office

[INTERNATIONAL PATENT CLASSIFICATION] G06F 13/00

G06F 13/351

H04L 11/20

[INVENTOR]

[ADDRESS] c/o Matsushita Electric Industrial Co., Ltd.

1006, Kadoma, Kadoma-City, Osaka

[NAME] Susumu KOBAYASHI

[INVENTOR]

[ADDRESS] c/o Matsushita Electric Industrial Co., Ltd.

1006, Kadoma, Kadoma-City, Osaka

[NAME] Takeshi OHMURA

[INVENTOR]

[ADDRESS] c/o Matsushita Electric Industrial Co., Ltd.

1006, Kadoma, Kadoma-City, Osaka

[NAME] Masanori NAKANISHI

[INVENTOR]

[ADDRESS] c/o Matsushita Information Systems Research Laboratory

Hiroshima Co., Ltd

3-10-18, Kagamiyama, Higashi-Hiroshima-City, Hiroshima

[NAME] Tetsuji SUMIDA

[INVENTOR]

[ADDRESS] c/o Matsushita Information Systems Research Laboratory

Hiroshima Co., Ltd

3-10-18, Kagamiyama, Higashi-Hiroshima-City, Hiroshima

[NAME] Eiji UEDA

[APPLICANT]

[CODE NO.] 000005821

[NAME] Matsushita Electric Industrial Co., Ltd.

[PATENT AGENT]

[CODE NO.] 100090446

[PATENT ATTORNEY]

[NAME] Shiro Nakajima

[PATENT AGENT]

[CODE NO.] 100109210

[PATENT ATTORNEY]

[NAME] Hiromori Nii

[CHARGES]

[RECEIPT NO.] 014823

[AMOUNT] ¥21,000

[LIST OF ENCLOSURES]

Specification 1

Drawings 1

Abstract 1

[GENERAL POWER OF ATTORNEY NO.] 9810105

[PROOF] Necessary.

[DOCUMENT] Specification

[TITLE OF THE INVENTION] SYSTEM FOR TRANSMISSION/RECEPTION OF  
E-MAIL WITH ATTACHED FILES

5 [CLAIMS]

[CLAIM 1] An e-mail transmission/reception system that is connected  
to a mail terminal via a network, and that includes a mail server  
and a mail gateway,

the mail server comprising:

10 a mail holding unit operable to receive and hold an e-mail  
message together with one or more files attached to the e-mail message,  
the e-mail message being addressed to a user of the mail terminal;  
and

a mail distributing unit operable to receive an e-mail  
15 message transmitted from the mail gateway and distribute the received  
e-mail message to a destination terminal, and

the mail gateway comprising:

an ID generating unit operable to generate an identifier  
each in correspondence with an attached file that is held by the  
20 mail holding unit;

a notifying unit operable to notify the mail terminal a  
list of the identifier each of which is generated by the ID generating  
unit in correspondence with an attached file;

a receiving unit operable to receive the e-mail message  
25 transmitted without the attached file but with an identifier that  
the user selects from the identifier list;

an attached file acquiring unit operable to acquire from

the mail holding unit an attached file corresponding to the identifier transmitted with the e-mail message that is received by the receiving unit;

5 a constructing unit operable to construct an e-mail message by attaching the attached file that is acquired by the attached file acquiring unit to the e-mail message that is received by the receiving unit; and

a mail transmitting unit operable to transmit to the mail server the e-mail message constructed by the constructing unit.

10

[CLAIM 2] An e-mail transmission/reception system that is connected to a mail terminal via a network and that includes a mail gateway,

the mail gateway comprising:

15 a mail holding unit operable to receive and hold an e-mail message together with one or more files attached to the e-mail message, the e-mail message being addressed to a user of the mail terminal;

an ID generating unit operable to generate an identifier each in correspondence with an attached file that is held by the mail holding unit;

20 a notifying unit operable to notify the mail terminal a list of the identifier each of which is generated by the ID generating unit in correspondence with an attached file;

a receiving unit operable to receive the e-mail message transmitted without the attached file but with an identifier that 25 the user selects from the identifier list;

an attached file acquiring unit operable to acquire from the mail holding unit an attached file corresponding to the identifier



transmitted with the e-mail message that is received by the receiving unit;

a constructing unit operable to construct an e-mail message by attaching the attached file that is acquired by the attached file acquiring unit to the e-mail message that is received by the receiving unit; and

a mail transmitting unit operable to transmit to a destination terminal the e-mail message constructed by the constructing unit.

10

[CLAIM 3] The e-mail transmission/reception system of Claim 1 or 2, wherein

the mail holding unit passes, upon every receipt of an e-mail message having a file attached thereto, to the ID generating unit a list of the attached file, and

the ID generating unit generates the identifier in correspondence with the attached file based on the attached file list passed from the mail holding unit.

20 [CLAIM 4] The e-mail transmission/reception system of any of Claims 1 to 3, wherein

the mail terminal comprises:

an ID list acquiring unit operable to acquire from the mail gateway the identifier list showing the identifier each of which is generated by the ID generating unit in correspondence with an attached file;

a preparing unit operable to prepare the e-mail message

by attaching, as a substitute for the originally attached file, the identifier selected by the user from the identifier list acquired by the ID list acquiring unit; and

5 a transmitting unit operable to transmit the prepared e-mail message to the mail gateway.

[CLAIM 5] The e-mail transmission/reception system of any of Claims 1-3, wherein

the mail terminal comprises a file format registering unit  
10 operable to register, in the mail gateway, file formats of an attached file each adopted by a destination terminal,

the mail gateway comprises:

a file format storing unit operable to store the destination terminal and a corresponding file format that are registered by the  
15 file format registering unit; and

a file format converting unit operable to convert a file format of the attached file for each destination terminal in accordance with the destination terminals and the corresponding file formats that are stored in the file format storing unit, and

20 the constructing unit constructs the e-mail message by attaching, as a substitute for the attached file acquired by the attached file acquiring unit, the attached file that is converted by the file format converting unit.

25 [CLAIM 6] A mail gateway for mediating between a mail server and a mail terminal, the mail server receiving and holding an e-mail message together with one or more files attached to the e-mail message,

the e-mail message being addressed to a user of the mail terminal,  
the mail gateway comprising:

an ID generating unit operable to generate an identifier  
each in correspondence with an attached file that is held by the  
5 mail server;

a notifying unit operable to notify the mail terminal a  
list of the identifiers each of which is generated by the ID generating  
unit in correspondence with an attached file;

a receiving unit operable to receive the e-mail message  
10 transmitted without the attached file but with an identifier that  
the user selects from the identifier list;

an attached file acquiring unit operable to acquire from  
the mail holding unit an attached file corresponding to the identifier  
transmitted with the e-mail message that is received by the receiving  
15 unit;

a constructing unit operable to construct an e-mail message  
by attaching the attached file that is acquired by the attached file  
acquiring unit to the e-mail message that is received by the receiving  
unit; and

20 a mail transmitting unit operable to transmit to the mail  
server the e-mail message constructed by the constructing unit.

[CLAIM 7] A mail terminal that is connected to a mail gateway via  
a network, the mail gateway generating and managing an identifier  
25 each in correspondence with a file attached to an e-mail message  
that is addressed to a user of the mail terminal, the mail terminal  
comprising:

an ID list acquiring unit operable to acquire from the mail gateway a list of identifier each of which corresponds to an attached file;

5 a preparing unit operable to prepare the e-mail message by attaching, as a substitute for the originally attached file, the identifier selected by the user from the identifier list acquired by the ID list acquiring unit; and

a transmitting unit operable to transmit the prepared e-mail message to the mail gateway.

10

[CLAIM 8] A recording medium storing a program to be executed by a computer for mediating between a mail terminal and a mail server, the mail server receiving and holding an e-mail message having a file attached thereto, the e-mail message being addressed to a user  
15 of the mail terminal, the program comprising:

an ID generating step of generating an identifier each in correspondence with an attached file that is held by the mail server;

20 a notifying step of notifying the mail terminal a list of the identifier each of which is generated in the ID generating step in correspondence with an attached file;

a receiving step of receiving the e-mail message transmitted without the attached file but with an identifier that the user selects from the identifier list;

25 an attached file acquiring step of acquiring from the mail server an attached file corresponding to the identifier transmitted with the e-mail message that is received in the receiving step;

a constructing step of constructing an e-mail message by

attaching the attached file that is acquired in the attached file acquiring step to the e-mail message that is received in the receiving step; and

a mail transmitting step of transmitting to the mail server  
5 the e-mail message constructed in the constructing step.

[CLAIM 9] A recording medium storing a program to be executed by a computer that is connected to a mail gateway via a network, the mail gateway generating and managing an identifier each in  
10 correspondence with a file attached to an e-mail message addressed to a user, the program comprising:

an ID list acquiring step of acquiring from the mail gateway a list of identifier each of which corresponds to an attached file;

a preparing step of preparing the e-mail message by attaching,  
15 as a substitute for the originally attached file, an identifier selected by the user from the identifier list acquired in the ID list acquiring step; and

a transmitting step of transmitting to the mail gateway the e-mail message prepared in the preparing step.

20

[CLAIM 10] The e-mail transmission/reception system of Claim 4, wherein

the mail terminal comprises a share-notifying unit operable to notify the mail gateway that the file attached to the e-mail message  
25 addressed to the user of the mail terminal is to be shared with other users,

the mail gateway comprises:

an attached file sharing unit operable, in response to the notification from the share-notifying unit, to perform processing so that the attached file held by the mail holding unit is shared with said other users; and

5           a shared-ID generating unit operable to generate a shared identifier in correspondence with the attached file that is made shared by the attached file sharing unit, the shared identifier being available for the users who share the attached file,

the share-notifying unit includes:

10           a share-user designating subunit operable to designate, for each attached file, a user to share the attached file; and

            a share-file designating subunit operable to designate an attached file to be shared,

            the attached file sharing unit performs the processing so  
15   that, of attached files transmitted to said other users, only the attached file designated by the share-file designating subunit is shared with the users designated by the share-user designating subunit,

            the notifying unit further notifies the users who share  
20   the shared attached file of a list of shared-identifier each of which is generated by the shared-ID generating unit in correspondence with a shared file,

            the attached file acquiring unit further acquires an attached file corresponding to the shared identifier, and

25           the ID list acquiring unit further acquires the shared-ID list showing the shared identifier each corresponding to a file that the user of the mail terminal shares.

[DETAILED DESCRIPTION OF THE INVENTION]

[0001]

[FIELD OF THE INVENTION]

5           The present invention relates to an e-mail transmission/reception system. More specifically, the present invention relates to a system for transmission/reception of e-mail with attached files.

[0002]

10 [DESCRIPTION OF THE RELATED ART]

          The Internet is basically available through terminals provided at offices and homes. Recently, however, new usage patterns of the Internet such as "mobile computing" and "mobile Internet" are becoming common. In the mobile computing, the Internet is  
15 accessed by cellular phones and Personal Handy-phone Systems (PHS) connected to personal computers or Personal Digital Assistants (PDA). The mobile Internet (e.g., Internet service for cellular phones) refers to a usage pattern that combines mobile machines, which are free from restrictions on time and space, and the Internet, which  
20 contains information all over the world. As the mobile computing and the mobile Internet become widespread, it is now possible to easily send and receive e-mail anytime and anywhere. However, when sending e-mail with attached files to the cellular phones and PHSs, the attached files are automatically deleted in most of the mobile  
25 Internet services.

[0003]

          Meanwhile, there are some mobile Internet services for

storing attached files in the server and forwarding them to another address. For instance, a service named "MOZIO e-mail" stores an attached file included in the received e-mail in a mail server, adds a message "The mail includes an attached file" to the e-mail from  
5 which the attached file has been removed to inform a subscriber of the existence of the attached file. Then, if the subscriber forwards the e-mail with such a message from PHS to another address that is accessible from a personal computer or the like, the mail server attaches the stored file to the e-mail and sends the e-mail to said  
10 another address. Thus, the subscriber can receive the e-mail with the attached file by means of the personal computer.

[0004]

In addition, similar technology is disclosed in the Japanese Laid-Open Patent Application No. 11-175419. This application  
15 discloses an e-mail transmission/reception system in which an e-mail received by one mail server together with an attached file is forwarded to another mail server specified by another address without actually attaching the attached file, so that said another mail server still receives the e-mail together with the attached file.

20 [0005]

This e-mail transmission/reception system is composed of a mail terminal equipped with Mail User Agent (MUA), a mail gateway that relays e-mail between the mail terminal and a mail server, and the mail server equipped with Mail Transport Agent (MTA).

25 Here, the MUA is a program for providing a user interface to read and write e-mail, and the MTA is a program for delivering e-mail.

[0006]



When receiving from the mail terminal an acquisition request for the e-mail which is received by the mail server, the mail gateway acquires the e-mail from the mail server, separates an attached file from the e-mail, stores the separated file having a mail ID, and  
5 manages the file. When receiving e-mail (consisting of the main body and a mail ID for identifying the original mail) that should be forwarded to another address from the mail terminal, the mail gateway attaches the stored and managed attached file to the e-mail on the basis of the mail ID for identifying the original mail and  
10 sends the e-mail consisting of the main body and the attached file to the mail server.

[0007]

In this way, the above-mentioned system enables the mail terminal to send e-mail with an attached file to a forwarding address  
15 only by sending e-mail having a mail ID for identifying the original mail to the mail gateway.

[0008]

[THE PROBLEMS THE INVENTION IS GOING TO SOLVE]

However, according to the above-mentioned conventional system,  
20 when a plurality of attached files are included in the mail, a file to be attached cannot be selected from the plurality of attached files but all files included in the e-mail are unconditionally attached to the e-mail, because mail IDs are used for linking e-mail and attached files. That is, in the conventional system, it is  
25 impossible to send e-mail including an attached file that a user selects among a plurality of attached files without attaching the attached file by the mail terminal. The same goes for the

above-mentioned service "MOZIO e-mail."

[0009]

To address the above-mentioned problems, the object of the present invention is to provide an e-mail transmission/reception system, a mail gateway, a mail terminal, and a program recording medium by which, when using attached files included in the received e-mail (e.g., forwarding of e-mail), a user can select attached files that the user wants to attach to the e-mail among a plurality of attached files included in the received plural pieces of e-mail, and the e-mail including the selected attached files can be transmitted to another address of the e-mail, without attaching requiring the user to attach the selected attached files to the e-mail using the mail terminal.

[0010]

15 [MEANS TO SOLVE THE PROBLEMS]

To solve the above problems, an e-mail transmission/reception system according to the present invention is connected to a mail terminal via a network, and includes a mail server and a mail gateway. The mail server comprises: a mail holding unit operable to receive and hold an e-mail message together with one or more files attached to the e-mail message, the e-mail message being addressed to a user of the mail terminal; and a mail distributing unit operable to receive an e-mail message transmitted from the mail gateway and distribute the received e-mail message to a destination terminal. The mail gateway comprises: an ID generating unit operable to generate an identifier each in correspondence with an attached file that is held by the mail holding unit; a notifying unit operable

to notify the mail terminal a list of the identifier each of which is generated by the ID generating unit in correspondence with an attached file; a receiving unit operable to receive the e-mail message transmitted without the attached file but with an identifier that the user selects from the identifier list; an attached file acquiring unit operable to acquire from the mail holding unit an attached file corresponding to the identifier transmitted with the e-mail message that is received by the receiving unit; a constructing unit operable to construct an e-mail message by attaching the attached file that is acquired by the attached file acquiring unit to the e-mail message that is received by the receiving unit; and a mail transmitting unit operable to transmit to the mail server the e-mail message constructed by the constructing unit.

[0011]

Alternatively, an e-mail transmission/reception system according to the present invention is connected to a mail terminal via a network, and includes a mail gateway. The mail gateway comprises: a mail holding unit operable to receive and hold an e-mail message together with one or more files attached to the e-mail message, the e-mail message being addressed to a user of the mail terminal; an ID generating unit operable to generate an identifier each in correspondence with an attached file that is held by the mail holding unit; a notifying unit operable to notify the mail terminal a list of the identifier each of which is generated by the ID generating unit in correspondence with an attached file; a receiving unit operable to receive the e-mail message transmitted without the attached file but with an identifier that the user selects from the

identifier list; an attached file acquiring unit operable to acquire from the mail holding unit an attached file corresponding to the identifier transmitted with the e-mail message that is received by the receiving unit; a constructing unit operable to construct an e-mail message by attaching the attached file that is acquired by the attached file acquiring unit to the e-mail message that is received by the receiving unit; and a mail transmitting unit operable to transmit to a destination terminal the e-mail message constructed by the constructing unit.

10 [0012]

Further, the mail holding unit may pass, upon every receipt of an e-mail message having a file attached thereto, to the ID generating unit a list of the attached file, and the ID generating unit may generate the identifier in correspondence with the attached file based on the attached file list passed from the mail holding unit.

Further, the mail terminal may comprise: an ID list acquiring unit operable to acquire from the mail gateway the identifier list showing the identifier each of which is generated by the ID generating unit in correspondence with an attached file; a preparing unit operable to prepare the e-mail message by attaching, as a substitute for the originally attached file, the identifier selected by the user from the identifier list acquired by the ID list acquiring unit; and a transmitting unit operable to transmit the prepared e-mail message to the mail gateway.

[0013]

Further, the mail terminal may comprise a file format

registering unit operable to register, in the mail gateway, file formats of an attached file each adopted by a destination terminal. The mail gateway may comprise: a file format storing unit operable to store the destination terminal and a corresponding file format  
5 that are registered by the file format registering unit; and a file format converting unit operable to convert a file format of the attached file for each destination terminal in accordance with the destination terminals and the corresponding file formats that are stored in the file format storing unit. The constructing unit may  
10 construct the e-mail message by attaching, as a substitute for the attached file acquired by the attached file acquiring unit, the attached file that is converted by the file format converting unit.  
[0014]

To solve the above problems, a mail gateway according to  
15 the present invention is a mail gateway for mediating between a mail server and a mail terminal. The mail server receives and holds an e-mail message together with one or more files attached to the e-mail message that is addressed to a user of the mail terminal. The mail gateway comprises: an ID generating unit operable to generate an  
20 identifier each in correspondence with an attached file that is held by the mail server; a notifying unit operable to notify the mail terminal a list of the identifiers each of which is generated by the ID generating unit in correspondence with an attached file; a receiving unit operable to receive the e-mail message transmitted  
25 without the attached file but with an identifier that the user selects from the identifier list; an attached file acquiring unit operable to acquire from the mail holding unit an attached file corresponding

to the identifier transmitted with the e-mail message that is received by the receiving unit; a constructing unit operable to construct an e-mail message by attaching the attached file that is acquired by the attached file acquiring unit to the e-mail message that is received by the receiving unit; and a mail transmitting unit operable to transmit to the mail server the e-mail message constructed by the constructing unit.

[0015]

To solve the above problems, a mail terminal according to the present invention is a mail terminal connected to a mail gateway via a network. The mail gateway generates and manages an identifier each in correspondence with a file attached to an e-mail message that is addressed to a user of the mail terminal. The mail terminal comprises: an ID list acquiring unit operable to acquire from the mail gateway a list of identifier each of which corresponds to an attached file; a preparing unit operable to prepare the e-mail message by attaching, as a substitute for the originally attached file, the identifier selected by the user from the identifier list acquired by the ID list acquiring unit; and a transmitting unit operable to transmit the prepared e-mail message to the mail gateway.

[0016]

To solve the above problems, a recording medium storing a program to be executed by a computer for mediating a mail server and a mail terminal according to the present invention is a recording medium storing a program to be executed by a computer for mediating between a mail terminal and a mail server, the mail server receiving and holding an e-mail message having a file attached thereto. The

e-mail message is addressed to a user of the mail terminal. The program comprises: an ID generating step of generating an identifier each in correspondence with an attached file that is held by the mail server; a notifying step of notifying the mail terminal a list  
5 of the identifier each of which is generated in the ID generating step in correspondence with an attached file; a receiving step of receiving the e-mail message transmitted without the attached file but with an identifier that the user selects from the identifier list; an attached file acquiring step of acquiring from the mail  
10 server an attached file corresponding to the identifier transmitted with the e-mail message that is received in the receiving step; a constructing step of constructing an e-mail message by attaching the attached file that is acquired in the attached file acquiring step to the e-mail message that is received in the receiving step;  
15 and a mail transmitting step of transmitting to the mail server the e-mail message constructed in the constructing step.

[0017]

To solve the above problems, a recording medium storing a program to be executed by a computer connected via a network to  
20 a mail gateway according to the present invention is a recording medium storing a program to be executed by a computer that is connected to a mail gateway via a network. The mail gateway generates and manages an identifier each in correspondence with a file attached to an e-mail message addressed to a user. The program comprises:  
25 an ID list acquiring step of acquiring from the mail gateway a list of identifier each of which corresponds to an attached file; a preparing step of preparing the e-mail message by attaching, as a

substitute for the originally attached file, an identifier selected by the user from the identifier list acquired in the ID list acquiring step; and a transmitting step of transmitting to the mail gateway the e-mail message prepared in the preparing step.

5 [0018]

To solve the above problems, in the e-mail transmission/reception system according to the present invention, the mail terminal further comprises a share-notifying unit operable to notify the mail gateway that the file attached to the e-mail message  
10 addressed to the user of the mail terminal is to be shared with other users. The mail gateway further comprises: an attached file sharing unit operable, in response to the notification from the share-notifying unit, to perform processing so that the attached file held by the mail holding unit is shared with said other users;  
15 and a shared-ID generating unit operable to generate a shared identifier in correspondence with the attached file that is made shared by the attached file sharing unit. The shared identifier is available for the users who share the attached file. The share-notifying unit includes: a share-user designating subunit  
20 operable to designate, for each attached file, a user to share the attached file; and a share-file designating subunit operable to designate an attached file to be shared. The attached file sharing unit performs the processing so that, of attached files transmitted to said other users, only the attached file designated by the  
25 share-file designating subunit is shared with the users designated by the share-user designating subunit. The notifying unit further notifies the users who share the shared attached file of a list of



shared-identifier each of which is generated by the shared-ID generating unit in correspondence with a shared file. The attached file acquiring unit further acquires an attached file corresponding to the shared identifier. The ID list acquiring unit further acquires the shared-ID list showing the shared identifier each corresponding to a file that the user of the mail terminal shares.

[0019]

#### [EMBODIMENTS OF THE INVENTION]

The following describes embodiments of the invention, with reference to the attached figures.

#### (Embodiment 1)

Fig. 1 is a block diagram showing the construction of the e-mail transmission/reception system including a mail terminal 100, a mail gateway 110, and a mail server 120.

[0020]

#### (Construction of Mail Terminal 100)

As shown in figure, the mail terminal 100 consists of an ID acquisition unit 101, a mail preparation unit 102, and a mail sending unit 103.

The ID acquisition unit 101 issues an ID acquisition request to the mail gateway 110 to acquire a list of attached IDs from the mail gateway 110. The acquired list is passed to the mail preparation unit 102.

[0021]

Here, the attached ID refers to an identifier that is generated for each of the attached files included in the mail

(hereafter abbreviated as "received mail") that the mail server 120 receives and stores for each user.

The mail preparation unit 102 prepares the mail that should be sent (hereafter abbreviated as "transmit mail" as distinguished  
5 from the received mail) and passes the mail to the mail sending unit 103. In this embodiment, when forwarding to another address an attached file that is included in the received mail, to be attached to the transmit mail is not the attached file itself but an attached ID that specifies the attached file in accordance with a list of  
10 the attached IDs passed from the ID acquisition unit 101.

[0022]

The mail sending unit 103 receives the transmit mail prepared by the mail preparation unit 102 and sends it to the mail gateway 110..

15 Here, the mail terminal 100 according to this embodiment is a mobile information terminal equipped with Mail User Agent (MUA). The MUA is a program for providing a user interface to read and write e-mail.

[0023]

20 (Construction of Mail Gateway 110)

The mail gateway 110 consists of an ID storing unit 111, a mail acquisition unit 112, a mail construction unit 113, a mail reception unit 114, and a mail sending unit 115.

The ID storing unit 111 stores attached IDs for each user.  
25 Here, the attached IDs are associated with the attached files by the mail acquisition unit 112.

[0024]

The mail acquisition unit 112 issues a request for acquisition of a list of attached files to the mail server 120 in response to the ID acquisition request from the mail terminal 100 to acquire the list from the mail server 120 and associates each  
5 attached file with an attached ID in accordance with the list. Then, the mail acquisition unit 112 stores the associated attached IDs in the ID storing unit 111 and sends it to the mail terminal 100. Also, the mail acquisition unit 112, in response to a request for acquisition of an attached file from the mail construction unit 113  
10 and in accordance with correspondences between attached files and attached IDs that is stored in the ID storing unit 111, issues a request for acquisition of the attached file corresponding to the attached ID to the mail server 120 to acquire the attached file from the mail server 120, and passes it to the mail construction unit  
15 113.

[0025]

The mail construction unit 113 receives the transmitted mail that has been passed from the mail reception unit 114, and analyses it. As a result of the analysis, in the case that the received mail  
20 does not include attached IDs, then the mail construction unit 113 passes the mail without processing to the mail sending unit 115. Alternatively, in the case that the received mail includes attached IDs, then the mail construction unit 113 extracts the attached IDs, issues to the mail acquisition unit 112 a request for acquisition  
25 of the attached files corresponding to the extracted attached IDs, and receives the attached file from the mail acquisition unit 112. Then, the mail construction unit 113 attaches the received attached

file, instead of the attached ID, to the transmitted mail that has been passed from the mail reception unit 114, thereby constructing a transmit mail, and passes the constructed transmit mail (hereafter called "constructed mail" as distinguished from the other mail) to the mail sending unit 115.

[0026]

The mail reception unit 114 receives the transmit mail transmitted from the mail terminal 100 and passes it to the mail construction unit 113.

10       The mail sending unit 115 receives a transmit mail or a constructed mail that has been passed from the mail construction unit 113 and sends it to the mail server 120.

(Construction of Mail Server 120)

15       The mail server 120 consists of a mail management unit 121, a mail spool 122, and a mail distribution unit 123.

[0027]

20       The mail management unit 121 manages the received mail. When receiving a request for acquisition of a received mail or an attached file from the mail gateway 110, the mail management unit 121 acquires the received mail or the attached file from the mail spool 122, and sends it to the mail gateway 110. In addition, when receiving a request for acquisition of a list of received mail or a list of attached files, the mail management unit 121 acquires the list from the mail spool 122 and sends it to the mail gateway 110.

25       [0028]

The mail spool 122 keeps received mail separately for each user.

The mail distribution unit 123 receives mail (received mail) transmitted through the Internet 130 or mail (transmit mail or constructed mail) transmitted from the mail gateway 110, keeps e-mail addressed to users (hereinafter referred to as "local" users") whose  
5 addresses are managed by the mail server 120 in the mail spool 122, and distributes e-mail addressed to the other users (hereinafter referred to as "remote users") whose addresses are not managed by the mail server 120 to such addresses.

[0029]

10 Here, the mail server 120 in this embodiment is a computer equipped with Mail Transport Agent (MTA). The MTA is a program for delivering e-mail.

(Structure of Received Mail 200 with Attached File)

Fig. 2 shows a data structure of received mail with an  
15 attached file that the mail server 120 receives.

[0030]

Here, the received mail 200 in this embodiment is described in a form of Multipurpose Internet Mail Extensions (MIME).

As shown in this figure, the received mail 200 with the  
20 attached file consists of a mail header 201, a message 202, and attached files 203 through 206.

[0031]

In the mail header 201, information for controlling the mail is described and the information includes a sender, receivers'  
25 addresses, a subject matter, a receiving date, a sending date, a message ID, and the like.

Here, the message ID is a character string that is generated

above-mentioned e-mail transmission/reception system, taking transmission of the received mail 200 as an example. Hereafter, the mail that is prepared when forwarding the received mail 200 will be called "forwarded mail" as distinguished from the other mails.

5            Fig. 3 is a flowchart showing a procedure for forwarding the received mail 200 by the mail terminal 100.

[0035]

As shown in this figure, when forwarding the received mail 200, firstly, the ID acquisition unit 101 in the mail terminal 100  
10       acquires from the mail gateway 110 a list of attached IDs that is in one to one correspondence with attached files included in the received mail 200 (Step S301).

Fig. 4 shows a sequence for acquiring an attached ID corresponding to each of the attached file included in the received  
15       mail 200.

[0036]

As shown in this figure, the mail terminal 100 issues an ID acquisition request to the mail gateway 110 (S401). The mail gateway that receives the ID acquisition request issues a request  
20       for acquisition of a list of attached files to the mail server 120 (S402). In response to the request for acquisition of a list of attached files, the mail server acquires from the mail spool 122 a list of attached files included in the received mail and sends the list to the mail gateway 110 (S403). Upon receipt of the list,  
25       the mail gateway 110 associates each of the attached files with an attached ID in accordance with the list and sends the list of the attached IDs to the mail terminal 100 (S404).

[0037]

Fig. 5(a) shows a data structure of the list of attached files that is transmitted in the above step S403 (a list 500 of attached files prepared from the received mail 200), and Fig. 5(b) shows a data structure of the list of IDs that is transmitted in the above step S404 (a list 501 of IDs prepared from the list 500).

As shown in this figure, the list 500 of attached files consists of a mail header 201 and MIME headers 221 through 261 of the received mail 200.

10 [0038]

The list 501 of IDs consists of an attached ID of a message 202 and attached IDs of attached files from 203 to 206. Here, the attached ID is made from a message ID that is described in the mail header 201 included in the attached file 500 and the order of each of the MIME headers 221 through 226 when counting the order from the top of the list (attached order of the attached files).

[0039]

Fig. 6 is a correspondence table between attached files and attached IDs in the case that the message ID of the received mail 200 is set at "0123456789".

According to this figure, an attached ID corresponding to the attached file 203 that is firstly attached in the received mail 200 is "0123456789:001", and an attached ID corresponding to the attached file 204 which is secondly attached is "0123456789:002". Hereafter, a format of attached IDs corresponding to attached files is set at the form of "message ID: attached order of the attached file", and the attached ID of the message 202 is set at

"0123456789:000".

[0040]

These attached IDs are stored in the ID storing unit 111, and they are passed from the mail acquisition unit 112 in the mail gateway 110 to the mail terminal 100. Then the ID acquisition unit 101 in the mail terminal 100 acquires a list of attached IDs that is transmitted from the mail gateway 110.

Here, the mail terminal 100 in this embodiment is equipped with MUA by which acquired attached IDs can be browsed to select the attached ID corresponding to the attached file that should be attached.

[0041]

Now, referring back to Fig. 3, the mail preparation unit 102 in the mail terminal 100 prepares forwarded mail including the attached ID that the ID acquisition unit 101 acquires as a substitute for the attached file included in the received mail 200 (Step S302).

Fig. 7 is a flowchart showing a procedure for describing attached IDs that the ID acquisition unit 101 acquires in the forwarded mail that is made from the received mail 200.

[0042]

As shown in this figure, firstly, the mail terminal 100 displays a list of attached IDs which is acquired from the mail gateway 110 (Step S701). Next, the mail terminal 100 receives the attached ID that is selected by a user having the mail terminal 100 (Step S702). Then, the mail terminal 100 describes the received attached ID in the mail header of the forwarded mail (Step S703).

[0043]



for each piece of e-mail that the mail server 120 receives. For instance, in the e-mail described in a form of Request For Comment (RFC) 822, it is the character string described in the "Message-ID" field.

5 [0032]

The message 202 consists of a MIME header 221 and a MIME message 222. Here, the mail header 201 and the message 202 are divided from each other by a blank line.

The attached files 203 through 206 are files that are attached  
10 to the e-mail and they include document data, image data, sound data, and so on. Each attached file consists of a MIME header and a MIME message.

[0033]

Here, the MIME header includes information on a contents  
15 name, a contents format (e.g., document, image, sound, their file formats and the like), and an encode format (base64 or the like). The MIME message includes the text data in the case that the attached file includes text data, and includes the text data that has been converted by means of base 64 or the like in the case that the attached  
20 file includes binary data (e.g., image, sound, or the like). Here, the MIME header and the MIME message are divided from each other by a blank line, and attached files are divided from one another by the boundary designating character string that is described in the mail header 201.

25 [0034]

(Operations)

The following describes the operation of the

Fig. 8 shows a state where the mail preparation unit 102 prepares the forwarded mail made from the received mail.

As shown in this figure, the mail terminal 100 consists of a terminal 800 and a pen 801.

5       The display unit in the terminal 800 displays forwarded mail 802 made from the received mail 200 and a list 803 of attached IDs that are in one to one correspondence with attached files included in the received mail 200. The list 803 is a list of attached IDs that the ID acquisition unit 101 acquires. The user having the mail  
10   terminal 100 selects from the list 803 by touch-inputting with the pen 801 the attached ID corresponding to the attached file that the user wants to attach to the forwarded mail 802. Then, the selected attached file is described in the mail header in the forwarded mail 802.

15   [0044]

Fig. 9 shows an example of a data structure of the forwarded mail 802 prepared by the mail preparation unit 102.

As shown in this figure, the forwarded mail 802 consists of a mail header 901 and a message 902. The mail header 901 consists  
20   of a sub header 911 including information on a sender, receivers' addresses, other receivers' addresses, a subject matter, and the like and a sub header 912 including attached IDs. Described in the sub header 911 is a forwarding address of the forwarded mail or the like. Described in the sub header 912 are the attached IDs that  
25   are selected from the attached ID list because the attached IDs correspond to the attached files desired to be acquired by the ID acquisition unit 101. The order of the described attached IDs is

the selected order and is also the order for attaching these IDs to the forwarded mail 802.

[0045]

Here, as for the mail having an RFC 822 format, a character string which begins with "X-" can be used as a user-definable string. Therefore, in this embodiment, a field identifier is set at "X-Attach-Mail-id" in order to identify that the attached ID corresponds to the attached file and "X-Attach-Mail-id: attached ID" is described in the sub header 912.

10 [0046]

The message 902 consists of text data and the content described there is the main body of the mail.

Then, referring back to Fig. 3, the mail terminal 100 passes the forwarded mail 802 prepared by the mail preparation unit 102 to the mail sending unit 103 to transmit it to the mail gateway 110 (Step S303).

[0047]

Fig. 10 shows a sequence for sending the forwarded mail 802 prepared from the received mail 200 by the mail preparation 102 to the forwarding address.

As shown in this figure, the mail terminal 100 sends to the mail gateway 110 the forwarded mail 802 prepared by the mail preparation unit 102 (S1001). Upon receipt of the forwarded mail 802, the mail gateway 110 analyses the received forwarded mail 802, and extracts the attached ID described in a field identifier "X-Attach-Mail-id". Then, the mail gateway 100 issues to the mail server 120 a request for acquisition of the attached file

corresponding to the extracted attached ID (the attached ID described in the sub header 912) (S1002). Upon receipt the request for acquisition of the attached file, the mail server 120 transmits to the mail gateway 110 the attached file corresponding to the attached ID that is stored in the mail spool 122 (S1003). Upon receipt of the attached file corresponding to the attached ID, the mail gateway 110 attaches the attached file corresponding to the received attached ID, as a substitute for the attached ID, to the mail thereby to construct the forwarded mail 802. Then, the mail gateway 110 sends the constructed mail to the mail server 120 (S1004). Upon receipt of the constructed mail, the mail server 120 keeps the mail in the mail spool 122 if the mail is addressed to a local user, and distributes the mail to receiver's address if the mail is addressed to a remote user (S1005).

15 [0048]

Fig. 11 is a flowchart showing a procedure for the mail gateway 110 to construct the forwarded mail sent from the mail terminal 100 (procedure from S1001 to S1004).

As shown in this figure, the mail reception unit 114 in the mail gateway 110 receives the mail that is sent from the mail terminal 100 (Step S1101) and passes the received mail to the mail construction unit 113. Then, the mail construction unit 113 analyses the mail to determine whether attached IDs are included or not (Step S1102).

25 [0049]

As a result of the analysis, in the case that attached IDs are included, the mail gateway 110 extracts the attached IDs from

the received mail (Step S1103) and acquires attached files corresponding to the attached IDs from the mail server 120 (Step S1104). Then, the mail gateway 110 attaches the acquired attached files, as a substitute for the attached IDs, to the mail to construct  
5 the mail (Step S1105). Finally, the mail gateway 110 passes the constructed mail to the mail sending unit 115 to transmit it to the mail server 120 (Step S1106).

[0050]

Alternatively, in the case that attached IDs are not included,  
10 the mail gateway 110 passes the received mail without processing to the mail sending unit 115 to transmit it to the mail server 120 (S1106).

Fig. 12 shows a data structure of the mail constructed from the forwarded mail 802 by the mail gateway 110.

15 As shown in this figure, the constructed mail 1200 consists of a mail header 1201, a message 1202, and attached files 1203 through 1206.

[0051]

In the mail header 1201, information for controlling the  
20 mail is described, and the information includes a sender, receivers' addresses, the other receivers' addresses, a subject matter, and the like.

The message 1202 consists of a MIME header 1221 and a MIME message 1222.

25 Each of the attached files 1203 through 1206 consists of a MIME header and a MIME message, and the attached files 1203, 1204, 1205, and 1206 correspond to a message 202, an attached files 206,

203, and 205, respectively.

[0052]

As stated above, according to the e-mail transmission/reception system of this embodiment, an attached ID is associated with each of attached files included in the received mail 200 and forwarded mail 802 corresponding to the received mail 200 is prepared using the associated attached IDs by the mail terminal 100. Further, the constructed mail 1200 is constructed from the forwarded mail 802 by the mail gateway 110. Finally, the constructed mail 1200 is distributed as a substitute for the forwarded mail 802 from the mail server 120 to the receivers' addresses of the mail.

[0053]

(Others)

In the above embodiment, the mail terminal 100 is a mobile information terminal. However, this may be a cellular phone, a handheld PC, a personal computer (PC), or the like.

In the above embodiment, the mail terminal 100 acquires attached IDs for each piece of e-mail. However, the mail terminal 100 may acquire attached files which correspond to a plurality of attached files included in a plurality of pieces of e-mail.

[0054]

As for the mail terminal 100 in this embodiment, when preparing a new e-mail with an attached file using a plurality of attached files included in the stored plurality pieces of e-mail, the new e-mail may include an attached ID corresponding to the attached file as a substitute for the attached file.

In the above embodiment, the mail gateway 110 associates

attached IDs with attached files for each piece of e-mail. However,  
the mail gateway 110 may associates attached IDs with attached files  
using a list prepared by bringing together a plurality of lists of  
attached files, in which each of the lists are included in a piece  
5 of e-mail.

[0055]

In the above embodiment, the mail server 120 transmits a  
list of attached files in accordance with a request for acquisition  
of a list of attached files from the mail gateway 110. However,  
10 whenever e-mail addressed to the user having the mail terminal 100  
is received, the mail server 120 may transmit a list of attached  
files included in the received mail to the mail gateway 110.

[0056]

In the above embodiment, a list of attached files includes  
15 header information consisting of a mail header and a MIME header  
of the received mail. However, this may not be header information  
on the received mail, but may be any information prepared from the  
header information on the received mail and by which attached files  
can be identified. For example, this may be a list of file names  
20 of the attached files, or simply the number of attached files.

[0057]

In the above embodiment, a format of the attached IDs is  
set at "message ID: the attached order of the attached file". However,  
this may be set at "message ID: the attached order of the attached  
25 file: file name of the attached file".

In the above embodiment, a list of attached files is browsed  
by using MUA provided in the mail terminal 100. However, the browsing

(acquisition) procedure may be performed using WWW browser software.

[0058]

The mail gateway 110 and the mail server 120 may be constructed as an integrated computer system.

5       The e-mail transmission/reception system of this embodiment can be realized by providing a program for attaching an attached file corresponding to an attached ID and constructing mail and a program for preparing e-mail with the attached ID corresponding to the attached file that should be attached and by executing these  
10 programs on general hardware such as computers. If these programs are recorded on recording media such as CD-ROMs that are readable for computers, they can be run on another computer. Further, these programs can be executed on the computer which downloads them via communication media such as networks.

15 [0059]

(Embodiment 2)

Fig. 13 is a block diagram showing the construction of the e-mail transmission/reception system according to the second embodiment including a mail terminal 140, a mail gateway 150, and  
20 a mail server 120.

The figure is different from the construction in Fig. 1 in that the mail terminal 140 and the mail gateway 150 are provided as substitutes for the mail terminal 100 and the mail gateway 110, respectively. In the following description, explanation for the  
25 same elements as in Fig. 1 will be omitted, but different elements will be focused on.

[0060]



(Different Elements from Mail Terminal 100)

As shown in the figure, the mail terminal 140 further includes a file format registration unit 141.

The file format registration unit 141 transmits file format  
5 conversion information including a receiver's address of the mail  
and a file format of the attached files which should be adopted by  
the receiver to the mail gateway 150.

[0061]

(Different Elements from Mail Gateway 110)

10 The mail gateway 150 includes a data conversion unit 151,  
a file format storing unit 152, and a mail construction unit 153.

The data conversion unit 151 receives file format conversion  
information transmitted from the mail terminal 140 and stores the  
information in the file format storing unit 152. In addition, the  
15 data conversion unit 151 converts a file format of the attached file  
passed from the mail construction unit 153. Here, the conversion  
is performed separately for each receiver's address in accordance  
with the file format conversion information stored in the file format  
storing unit 152. Then, the data conversion unit 151 passes the  
20 converted attached file to the mail construction unit 153.

[0062]

The file format storing unit 152 stores file format  
conversion information for each receiver's address.

The mail construction unit 153 is different from the mail  
25 construction unit 113 shown in Fig. 1 in that the mail construction  
unit further passes to the data conversion unit 151 attached files  
acquired by the mail acquisition unit 112 and a receiver's address

of the attached file, receives the attached files that is converted by the data conversion unit 151, and constructs the mail for each receiver's address.

[0063]

5 (Different Operations from Embodiment 1)

As for the e-mail transmission/reception system having the above-mentioned construction, explanation for the operations will be given below with mainly focusing on the differences from Embodiment 1.

10 Fig. 14 is a flowchart showing a procedure for converting an attached file for each of the receivers' addresses and a procedure for constructing the converted attached file for each of the receivers' addresses by the mail gateway 150.

[0064]

15 As shown in this figure, the mail reception unit 114 in the mail gateway 150 receives the mail sent from the mail terminal 140 (Step S1401). When the received mail is passed to the mail construction unit 153, the mail construction unit 153 extracts a receiver's address of the mail and substitutes the total number of  
20 the receivers' addresses into a variable N (Step S1402). Then, the mail gateway 150 analyses whether attached IDs are included in the mail (Step S1403).

[0065]

As a result of the analysis, in the case that attached IDs  
25 are included, the mail gateway 150 extracts the attached IDs associated with the attached files from the mail (Step S1404), and acquires the attached files corresponding to the extracted attached

IDs from the mail server 120 (Step S1405). Alternatively, in the case that attached IDs are not included, the mail gateway 150 checks the number of attached files included in the mail (Step S1406). In the case that the mail does not include attached files, then the  
5 mail gateway 150 passes the received mail without processing to the mail sending unit 115 to transmit it to the mail server 120 (Step S1417).

[0066]

Next, the mail gateway 150 substitutes the total number  
10 of attached files included in the mail into a variable M (S1407), substitutes 1 into a variable X (Step S1408), and substitutes 1 into a variable Y (Step S1409).

Then, the mail gateway 150 checks a file format of the Yth  
attached file corresponding to the Xth receiver's address in  
15 accordance with file format conversion information stored in the file format storing unit 152 (Step S1410).

[0067]

In the case that the receiver's address and the file format  
of the attached file that the receiver should adopt correspond each  
20 other (the file format has been specified), the mail gateway 150 converts the format of the attached file into the file format that the receiver should adopt (Step S1411).

Next, the mail gateway 150 judges whether the variable Y  
equals to the variable M or not (Step S1412). In the case that they  
25 are not equal, then 1 is added to the variable Y and the procedure returns to the Step S1410 (Step S1413). In the case that they are equal, the mail gateway 150 attaches the acquired attached file or

the converted attached file as a substitute for the attached ID or the attached file to the mail addressed to the Xth receiver's address to construct mail (Step S1414).

[0068]

5           Next, the mail gateway 150 judges whether the variable X equals to the variable N or not (Step S1415). In the case that they are not equal, then 1 is added to the variable X and the procedure returns to the Step S1409 (Step S1416). In the case that they are equal, the mail gateway 150 passes the mail constructed for each  
10 receiver's address to the mail sending unit 115 to transmit it to the mail server 120 (Step S1417).

[0069]

Fig. 15 shows a data structure of the e-mail (prepared by the mail preparation unit 102) sent from the mail terminal 140.

15           As shown in this figure, the mail 1500 consists of a mail header 1501 and a message 1502.

In the mail header 1501, sender (From: user1@aaa.aaa.aa), receivers' addresses (To:user2@bbb.bbb.bb, user3@ccc.ccc.cc), the other receivers' addresses (Cc:user4@ddd.ddd.dd), a subject matter  
20 (Subject: this is data!) are described.

In addition, attached IDs which are associated with the attached files that should be attached to the mail 1500 are described (X-Attach-Mail-id:00112233:002 and X-Attach-Mail-id:00112233:004).

25 [0070]

The message 1502 consists of text data and the content described there is the main body of the mail.

Here, an attached file which is associated with the attached ID "00112233:002" is a document file whose file name is "shiryou1.doc" and an attached file which is associated with the attached ID "00112233:004" is an image file whose file name is "shiryou2.bmp".

5 [0071]

Fig. 16 is an example of file format conversion information stored in the file format storing unit 152.

As shown in this figure, the file format storing unit 152 stores a correspondence table 1600 between receivers' addresses and file formats of attached files that the receiver should adopt.

[0072]

Fig. 17 shows an example of a data structure of the mail constructed using the mail 1500 for each of the receivers' addresses. In constructing the mail, file formats of the attached files are converted for each receiver's address in accordance with the file format conversion information shown in the correspondence table 1600.

As shown in this figure, three pieces of e-mail 1700 (receiver's address:user2@bbb.bbb.bb), 1701 (receiver's address:user3@ccc.ccc.cc), and 1702 (receiver's address:user4@ddd.ddd.dd) are prepared from one piece of e-mail 1500.

[0073]

As stated above, according to the e-mail transmission/reception system of this embodiment, when forwarding attached files included in the received mail, file formats of the attached files are converted for each receiver's address to construct the mail. Therefore, the system can deliver e-mail including attached files to a plurality of receivers' addresses, in which

considerations are given to the attached files for each receiver's address.

[0074]

(Others)

5           In the above embodiment, the mail terminal 140 may register file format conversion information in the mail gateway 150 by means of WWW browser software.

[0075]

(Embodiment 3)

10           Fig. 18 is a block diagram showing the construction of the e-mail transmission/reception system according to the third embodiment. The e-mail transmission/reception system includes a mail terminal 160, a mail gateway 170, and a mail server 120.

          The figure is different from the construction in Fig. 1  
15   in that the mail terminal 160 and the mail gateway 170 are provided as substitutes for the mail terminal 100 and the mail gateway 110, respectively. In the following description, explanation for the same elements as in Fig. 1 will be omitted, but different elements will be focused on.

20   (Different Elements from Mail Terminal 100)

          The mail terminal 160 includes a mail preparation unit 162.

[0076]

          The mail preparation unit 162 is different from the mail preparation unit 102 shown in Fig. 1 in that a data format of a field  
25   "X-Attach-Mail-id" described in the mail header is set at "X-Attach-Mail-id:attached ID:processing information on attached files" instead of "X-Attach-Mail-id:attached Id".

[0077]

Here, the processing information on attached files specifies a process in which the mail gateway 170 processes attached files corresponding to the attached IDs selected by the user (e.g.,  
5 conversion of file formats of the attached files) and this means information consisting of "file formats of the attached files" which are to be converted and "receiver's addresses of the converted attached files".

[0078]

10 That is, as for the mail whose mail header has a description "X-Attach-Mail-id: attached ID: processing information of the attached files", the file format of the mail is converted into the file format which is designated by the "file format of the attached files" included in the "processing information of the attached files"  
15 and transmits the converted attached files to the receiver's address which is designated by the "receiver's address of the attached files" included in the "processing information on the attached files".

[0079]

Here, the format of the "processing information on the  
20 attached files" in this embodiment is set at "file format of the attached files: receiver's address of the attached files". In addition, the "file format of the attached files" and the "receiver's address of the attached files" in the processing information on the attached information may be omissible. In the case that the former  
25 is omitted, the attached file corresponding to the "attached ID" is transmitted to the receiver's address which is designated by the "receiver's address of the attached files" in the "processing

information on the attached files". In the case that the latter is omitted, the attached file corresponding to the "attached ID" is converted to the file format which is designated by the "file format of the attached files" in the "processing information on the attached files" and attaches the converted attached file to the mail.  
5 [0080]

(Different Constructions from Mail Gateway 110)

The mail gateway 170 includes a data conversion unit 171, a fax sending unit 172, and a data conversion unit 173.

10 The data conversion unit 171 receives attached files and a file format to which the attached files should be converted from the mail construction unit 173, and converts a file format of the attached files. Then, the data conversion unit 171 passes the converted attached files to the mail construction unit 173.

15 [0081]

The FAX sending unit 172 receives the attached files (converted in a FAX form) from the mail construction unit 173 and a FAX receiver's address, and faxes the attached files to the FAX receiver's address.

20 The mail construction unit 173 is different from the mail construction unit 113 in that the mail construction unit 173 further passes to the data conversion unit 171 the attached files acquired by the mail acquisition unit 112 and the processing information (a file format and a receiver's address) on the attached files which  
25 is described in the mail header. Successively, the data conversion unit 171 converts the received attached files, and constructs mail for each receiver's address of the attached files. The constructed



mail is passed to the mail sending unit 115, and the attached files to be faxed are passed to the FAX sending unit 172 as well as the FAX number of the receiver.

[0082]

5 (Different Operations from Embodiment 1)

As for the e-mail transmission/reception system having the above-mentioned construction, explanation for the operations will be given below with mainly focusing on the differences from Embodiment 1.

10 The mail preparation unit 162 prepares mail whose mail header has the description "X-Attach-Mail-id: attached ID: processing information on the attached files". The prepared mail is passed to the mail sending unit 103 to be transmitted to the mail gateway 170. The mail gateway 170 that receives the mail from the mail  
15 terminal 160 performs a process for the attached file corresponding to the "attached ID" that is described in the mail header in accordance with the "processing information on the attached files" that is described in the mail header.

[0083]

20 Fig. 19 shows an example of a data structure of the mail prepared by the mail preparation unit 162.

As shown in this figure, the mail 1900 consists of a mail header 1901 and a message 1902. The mail header 1901 includes a sub header 1911 in which a sender (From: user\_a@xxx.xxx.xxx),  
25 receivers' addresses (To: user\_b@yyy.yyy.yyy, user\_c@zzz.zzz.zzz), and a subject matter (Subject: this is data!!) are described and a sub header 1912 in which attached IDs that are associated with

the attached files that should be attached are described.

[0084]

For instance, suppose that file names of the attached files corresponding to "ABCDEFGH:004", "PQRSTUVW:002", "EFGHIJKL:005", and "GHIJKLMN:003:fax" are respectively set at "File1.txt", "File2.gif", "File3.bmp", and "File4.jpg". In this case, the mail gateway 170 that receives the mail 1900 performs the following process in accordance with the description of the sub header 1912.

[0085]

10           The 4<sup>th</sup> attached file (when counting from the top in the mail) included in the mail "message ID: ABCDEFGH" is attached to the mail ("X-Attach-Mail-id: ABCDEFGH:004").

          The 2<sup>nd</sup> attached file (when counting from the top in the mail) included in the mail "message ID: PQRSTUVW" is converted to a bmp format, and the converted attached file (whose file name is changed to "File2.bmp" after conversion) is attached to the mail ("X-Attach-Mail-id: PQRSTUVW:002:bmp").

[0086]

          The 5<sup>th</sup> attached file (when counting from the top in the mail) included in the mail "message ID: EFGHIJKL" is converted to a jpg format, and the converted attached file (whose file name is changed to "File3.jpg" after conversion" is attached to the mail addressed to the receiver's address (user\_c@zzz.zzz.zzz) ("X-Attach-Mail-id:EFGHIJKL:005:jpg:user\_c@zzz.zzz.zzz").

25   [0087]

          The 3<sup>rd</sup> attached file (when counting from the top in the mail) included in the mail "message ID:GHIJKLMN" is converted to

a FAX format, and the converted attached file is faxed to the fax number "0123-45-6789" ("X-Attach-Mail-id: GHIJKLMNOP:003:fax:0123456789").

[0088]

5 As a result of the process by the mail gateway 170, e-mail is constructed for each receiver's address from the mail 1900.

Fig. 20 shows an example of a data structure of the mail constructed for each receiver's address from the mail 1900. Here, Fig. 20(a) shows constructed mail 2000 addressed to a receiver's address (user\_b@yyy.yyy.yyy) and Fig. 20(b) shows constructed mail 10 2001 addressed to a receiver's address (user\_c@zzz.zzz.zzz).

[0089]

As shown in these figures, when specifying "receiver's address of the attached files" in the "processing information on the attached files", the attached files are attached to the mail 15 addressed only to the specified receivers' addresses. When specifying a FAX format in the "file format of the attached files" and a FAX number in the "receiver's address of the attached files", the attached file corresponding to the specified attached ID is 20 converted to a FAX format and the converted attached file is faxed to the specified FAX number.

[0090]

As described above, according to the e-mail transmission/reception system of this embodiment, when forwarding 25 each of the attached files included in the received mail, file formats of the attached files are converted for each receiver's address to construct the mail. In addition, according to this embodiment, each

attached file can be faxed and printed by the fax as a handy printer. Thereby, the content of the received attached file can be confirmed by a user, even when the user does not have a tool for receiving e-mail.

5 [0091]  
(Others)

In the case that an attached file (e.g., sound information, moving video information) cannot be converted to a FAX format, the mail gateway 170 in the above embodiment may inform a sender of the mail and a receiver of the fax that the attached file can not be converted.

(Embodiment 4)

Fig. 21 is a block diagram showing the construction of the e-mail transmission/reception system according to the fourth embodiment. The transmission/reception system includes a mail terminal 180, a mail gateway 190, and a mail server 120.

[0092]

The figure is different from the construction shown in Fig. 1 in that the mail terminal 180 and the mail gateway 190 are provided as substitutes for the mail terminal 100 and the mail gateway 110, respectively. In the following description, explanation for the same elements as in Fig. 1 will be omitted, but different elements will be focused on.

(Different Constructions from Mail Terminal 100)

25 As shown in the figure, the mail terminal 180 is composed of an ID acquisition unit 181, a mail preparation unit 182, and a sharing notification unit 184.

[0093]

The ID acquisition unit 181 is different from the ID acquisition unit 101 shown in Fig. 1 in that the ID acquisition unit 181 notifies the sharing notification unit 184 of the attached files that should be shared with the other users out of the attached files sent to the user having the mail terminal 180. In this case, the ID acquisition unit 181 passes to the sharing notification unit 184 the attached IDs which are associated with the attached files to be shared with the other users. The attached IDs are selected from the list of the attached IDs that the ID acquisition unit 181 acquires. In addition, the ID acquisition unit 181 acquires a list of shared IDs which are associated with the attached files that are owned by the other users and the user having the mail terminal 180 shares. Then, the acquired list of the shared IDs is passed to the mail preparation unit 182.

[0094]

Here, unlike IDs that are associated with files by the mail acquisition unit 192, the shared IDs are identifiers that are associated with files by the shared ID management unit 194 and that are available only for sharers of attached files which are associated with the shared IDs.

The mail preparation unit 182 is different from the mail preparation unit 102 shown in Fig. 1 in that the mail preparation unit 182 can specify the attached files to be forwarded from among the shared IDs in accordance with the list of shared IDs passed from the ID acquisition unit 181. Here, the shared IDs may be specified as "X-Attach-Mail-id: shared Id" in the mail header instead of

"X-Attach-Mail-id: attached ID".

[0095]

The sharing notification unit 184 receives attached IDs from the ID acquisition unit 181, specifies a user (sharer) who shares the attached files corresponding to the attached IDs, and transmits shared information including the attached IDs and the sharers who shares the attached files to the mail gateway 190. Here, sharers can be specified for only the attached files that are owned by the user having the mail terminal 180.

10 [0096]

(Different Constructions from Mail Gateway 110)

The mail gateway 190 includes an ID storing unit 191, a mail acquisition unit 192, a mail construction unit 193, and a shared ID management unit 194.

15 The ID storing unit 191 is different from the ID storing unit 111 shown in Fig. 1 in that the ID storing unit 191 further stores a list of shared IDs which are associated with files by the shared ID management unit 194.

[0097]

20 Fig. 22 is a correspondence table consisting of "shared IDs", "attached IDs", and "sharers", which is stored in the ID storing unit 191.

The mail acquisition unit 192 is different from the mail acquisition unit 112 shown in Fig. 1 in that the mail acquisition unit 192 further transmits a list of shared IDs stored in the ID storing unit 191 to the mail terminal 180 in response to an ID acquisition request from the mail terminal 180. In addition, the

mail acquisition unit 192 acquires from the mail server 120 the attached files (which correspond to the attached IDs that corresponds to the shared IDs and which are owned by the other users) corresponding to the shared IDs in response to a request for acquisition of the attached files from the mail construction unit 193. The acquisition of the attached files are performed on the basis of the correspondence between the list of attached IDs and the list of shared IDs which are stored in the ID storing unit 191.

[0098]

The mail construction unit 193 is different from the mail construction unit 113 shown in Fig. 1 in that, in the case that the received mail includes shared IDs, the construction unit 193 extracts the shared IDs, issues a request for acquisition of the attached files corresponding to the shared IDs to the mail acquisition unit 192, and acquires the attached files from the mail acquisition unit 192. In this case, a sender of the mail must belong to sharers of the attached files.

[0099]

The shared ID management unit 194 receives shared information transmitted from the mail terminal 180, generates and associates shared IDs from the shared information for each attached ID of the shared information, associates "attached IDs" and "sharers" with the "shared IDs", and stores them in the ID storing unit 151. Here, in the case that the shared IDs have been associated with attached IDs in the shared information, the shared ID management unit 194 adds the shares of the shared information to the sharers corresponding to such shared IDs.

[0100]

(Different Operations from Mail Terminal 180)

As for the e-mail transmission/reception system having the above-mentioned construction, explanation for the operations will be given below with mainly focusing on the differences from Embodiment 1.

Fig. 23 is a flowchart showing a procedure for sharing the attached file belonging to a user of the mail terminal 180 with the other users.

10

[0101]

(Procedure by Embodiment 1)

The mail terminal 180 passes to the shared notification unit 184 the attached IDs which are associated with the attached files that should be shared with the other users and which are selected from the list of attached IDs that the ID acquisition unit 181 acquires (Step S2301). Next, the mail terminal 180 receives the attached IDs from the ID acquisition unit 181, specifies sharers of the attached files corresponding to the attached IDs, and transmits shared information on the attached IDs and the sharers of the attached files corresponding to the attached IDs to the mail gateway 190 (Step S2302). Here, sharers can be specified only for the attached files that are owned by the user having the mail terminal 180.

[0102]

25 (Procedure by Mail Gateway 190)

Then, the mail gateway 190 receives the shared information from the mail terminal 180, generates and associates shared IDs from



the shared information for each ID of the shared information, associates "attached IDs" and "sharers" with the "shared IDs", and stores them in the ID storing unit 191. Here, in the case that the shared IDs have been associated with attached IDs in the shared information, the shared ID management unit 194 adds the sharers of the shared information to the sharers corresponding to such shared IDs (Step S2303).

[0103]

As described above, the shared IDs (i.e., IDs associated with the shared attached files) are transmitted from the mail gateway 190 together with the attached IDs when the sharer of the attached IDs issues an ID acquisition request to the mail gateway 190. Then, the received shared IDs are made available among the sharers.

The following will describe the procedure for constructing the mail including the shared IDs transmitted from the mail terminal 180.

[0104]

Fig. 24 is a flowchart showing a procedure for the mail gateway 190 to construct the mail including the shared ID sent from the mail terminal 180.

As shown in this figure, the mail gateway 190 passes to the mail construction unit 193 the received mail that is sent from the mail terminal 180. The mail construction unit analyses whether the thus received mail includes shared IDs or not (Step S2401).

[0105]

As a result of the analysis, in the case that the mail does not include shared IDs, the mail gateway 190 passes the mail without

processing to the mail server 120 (Step S2405). In the case that the mail includes shared IDs, the mail gateway 190 extracts the shared IDs from the mail (Step S2402) and acquires the attached files corresponding to the extracted shared IDs from the mail server 120 (Step S2403). Then, the mail gateway 190 attaches the acquired attached files, as substitutes for the shared IDs, to the mail thereby to construct the mail (Step S2404). Finally, the mail gateway 190 sends the constructed mail to the mail server 120 (Step S2405).  
[0106]

10 As stated above, according to the e-mail transmission/reception system of this embodiment, each attached file included in the received mail can be shared with the other users and shared IDs can be associated with the shared attached files, so that the associated shared IDs are available among the sharers.  
15 Therefore, attached files that belong to the other users also can be transmitted to receivers of the mail by preparing the mail including the shared IDs.

[0107]

## 20 [EFFECTS OF THE INVENTION]

An e-mail transmission/reception system according to the present invention is connected to a mail terminal via a network, and includes a mail server and a mail gateway. The mail server comprises: a mail holding unit operable to receive and hold an e-mail  
25 message together with one or more files attached to the e-mail message, the e-mail message being addressed to a user of the mail terminal; and a mail distributing unit operable to receive an e-mail message

transmitted from the mail gateway and distribute the received e-mail message to a destination terminal. The mail gateway comprises: an ID generating unit operable to generate an identifier each in correspondence with an attached file that is held by the mail holding unit; a notifying unit operable to notify the mail terminal a list of the identifier each of which is generated by the ID generating unit in correspondence with an attached file; a receiving unit operable to receive the e-mail message transmitted without the attached file but with an identifier that the user selects from the identifier list; an attached file acquiring unit operable to acquire from the mail holding unit an attached file corresponding to the identifier transmitted with the e-mail message that is received by the receiving unit; a constructing unit operable to construct an e-mail message by attaching the attached file that is acquired by the attached file acquiring unit to the e-mail message that is received by the receiving unit; and a mail transmitting unit operable to transmit to the mail server the e-mail message constructed by the constructing unit.

[0108]

Alternatively, an e-mail transmission/reception system according to the present invention is connected to a mail terminal via a network, and includes a mail gateway. The mail gateway comprises: a mail holding unit operable to receive and hold an e-mail message together with one or more files attached to the e-mail message which is addressed to a user of the mail terminal; an ID generating unit operable to generate an identifier each in correspondence with an attached file that is held by the mail holding unit; a notifying

unit operable to notify the mail terminal a list of the identifier each of which is generated by the ID generating unit in correspondence with an attached file; a receiving unit operable to receive the e-mail message transmitted without the attached file but with an identifier  
5 that the user selects from the identifier list; an attached file acquiring unit operable to acquire from the mail holding unit an attached file corresponding to the identifier transmitted with the e-mail message that is received by the receiving unit; a constructing unit operable to construct an e-mail message by attaching the attached  
10 file that is acquired by the attached file acquiring unit to the e-mail message that is received by the receiving unit; and a mail transmitting unit operable to transmit to a destination terminal the e-mail message constructed by the constructing unit.

[0109]

15 With this construction, the e-mail transmission/reception system according to the present invention associates an attached ID with each file attached to the received e-mail in order to use the attached files. With this arrangement, an e-mail message that has been received with attached files is forwarded to another address  
20 together with any of the attached files desired to be forwarded merely by selecting attached IDs corresponding to the desired attached files rather than by actually attaching the desired attached files to the e-mail message at the mail terminal. In addition, it is possible to prepare a new e-mail message and to attach to the newly prepared  
25 e-mail message the attached files included in an e-mail message that has been received and stored in the system. Further, the e-mail message merely with attached IDs that are associated with attached

files is smaller in data size comparing with an e-mail message with attached files. This achieves an effect that a load applied to the line between the mail terminal and the mail gateway can be reduced, and therefore even with cellular phones whose transmission speed is low, attached files can be practicably (i.e., in a short time period and at a low cost) transmitted to its destination.

[0110]

Further, in the e-mail transmission/reception system according to the present invention, the mail holding unit may pass, upon every receipt of an e-mail message having a file attached thereto, to the ID generating unit a list of the attached file, and the ID generating unit may generate the identifier in correspondence with the attached file based on the attached file list passed from the mail holding unit.

[0111]

With this construction, the e-mail transmission/reception system according to the present invention achieves the following effects in addition to the above-stated effects. That is, when receiving an e-mail message, the e-mail transmission/reception system notifies a user of a destination terminal of the list of attached IDs that are associated with the attached files. This eliminates the need for the user of the destination terminal to perform a procedure for acquiring the list of attached IDs.

Further, in the e-mail transmission/reception system according to the present invention, the mail terminal may comprise: an ID list acquiring unit operable to acquire from the mail gateway the identifier list showing the identifier each of which is generated

by the ID generating unit in correspondence with an attached file;  
a preparing unit operable to prepare the e-mail message by attaching,  
as a substitute for the originally attached file, the identifier  
selected by the user from the identifier list acquired by the ID  
5 list acquiring unit; and a transmitting unit operable to transmit  
the prepared e-mail message to the mail gateway.

[0112]

With this construction, the e-mail transmission/reception  
system according to the present invention further achieves the  
10 following effects. That is, the mail terminal is allowed to prepare  
an e-mail message to which attached IDs that correspond to files  
attached to a received mail are attached, and transmit the prepared  
mail to another address.

Further, in the e-mail transmission/reception system  
15 according to the present invention, the mail terminal may comprise  
a file format registering unit operable to register, in the mail  
gateway, file formats of an attached file each adopted by a destination  
terminal. The mail gateway may comprise: a file format storing unit  
operable to store the destination terminal and a corresponding file  
20 format that are registered by the file format registering unit; and  
a file format converting unit operable to convert a file format of  
the attached file for each destination terminal in accordance with  
the destination terminals and the corresponding file formats that  
are stored in the file format storing unit. The constructing unit  
25 may construct the e-mail message by attaching, as a substitute for  
the attached file acquired by the attached file acquiring unit, the  
attached file that is converted by the file format converting unit.

[0113]

With this construction, the e-mail transmission/reception system according to the present invention further achieves the following effect. That is, attached files received with an e-mail message are converted suitably for each destination terminal for constructing a new e-mail message. Thus, a suitable e-mail message is transmitted to each destination terminal.

A mail gateway according to the present invention is a mail gateway for mediating between a mail server and a mail terminal.

10 The mail server receives and holds an e-mail message together with one or more files attached to the e-mail message that is addressed to a user of the mail terminal. The mail gateway comprises: an ID generating unit operable to generate an identifier each in correspondence with an attached file that is held by the mail server;

15 a notifying unit operable to notify the mail terminal a list of the identifiers each of which is generated by the ID generating unit in correspondence with an attached file; a receiving unit operable to receive the e-mail message transmitted without the attached file but with an identifier that the user selects from the identifier

20 list; an attached file acquiring unit operable to acquire from the mail holding unit an attached file corresponding to the identifier transmitted with the e-mail message that is received by the receiving unit; a constructing unit operable to construct an e-mail message by attaching the attached file that is acquired by the attached file

25 acquiring unit to the e-mail message that is received by the receiving unit; and a mail transmitting unit operable to transmit to the mail server the e-mail message constructed by the constructing unit.

[0114]

With this construction, the mail gateway according to the present invention achieves the following effects. That is, each file attached to a received e-mail message is assigned an attached  
5 ID. Thus, when using the files attached to the received e-mail message, to be attached to a new e-mail message are not the actual files but the attached IDs corresponding to attached files that are desired to be forwarded. In this manner, the desired attached files are transmitted to a receiver.

10 [0115]

A mail terminal according to the present invention is a mail terminal connected to a mail gateway via a network. The mail gateway generates and manages an identifier each in correspondence with a file attached to an e-mail message that is addressed to a  
15 user of the mail terminal. The mail terminal comprises: an ID list acquiring unit operable to acquire from the mail gateway a list of identifier each of which corresponds to an attached file; a preparing unit operable to prepare the e-mail message by attaching, as a substitute for the originally attached file, the identifier selected  
20 by the user from the identifier list acquired by the ID list acquiring unit; and a transmitting unit operable to transmit the prepared e-mail message to the mail gateway.

[0116]

With this construction, the mail terminal according to the  
25 present invention achieves the following effects. That is, when using files attached to the received e-mail, by preparing an e-mail message and attaching attached IDs thereto, the e-mail message is



transmitted to its destination together with attached files corresponding to the attached IDs.

A recording medium storing a program to be executed by a computer for mediating a mail server and a mail terminal according to the present invention is a recording medium storing a program to be executed by a computer for mediating between a mail terminal and a mail server, the mail server receiving and holding an e-mail message having a file attached thereto. The e-mail message is addressed to a user of the mail terminal. The program comprises:

an ID generating step of generating an identifier each in correspondence with an attached file that is held by the mail server; a notifying step of notifying the mail terminal a list of the identifier each of which is generated in the ID generating step in correspondence with an attached file; a receiving step of receiving the e-mail message transmitted without the attached file but with an identifier that the user selects from the identifier list; an attached file acquiring step of acquiring from the mail server an attached file corresponding to the identifier transmitted with the e-mail message that is received in the receiving step; a constructing step of constructing an e-mail message by attaching the attached file that is acquired in the attached file acquiring step to the e-mail message that is received in the receiving step; and a mail transmitting step of transmitting to the mail server the e-mail message constructed in the constructing step.

[0117]

With this construction, the computer readable recording medium storing the program for mediating between the mail terminal

and the mail server achieves the following effect. That is, by executing the program on general hardware such as computers, the hardware associates an attached ID with each of files attached to the received e-mail message. In this manner, when using the files  
5 attached to the received e-mail message, it is not necessary to attach to an e-mail message the attached files desired to be forwarded to another address. Instead, by attaching to the e-mail message the attached IDs corresponding to the desired attached files IDs, the e-mail message is transmitted from the mail terminal to another  
10 address, so that the e-mail message is received at the destination address together with the desired attached files.

[0118]

A recording medium storing a program to be executed by a computer connected via a network to a mail gateway according to the  
15 present invention is a recording medium storing a program to be executed by a computer that is connected to a mail gateway via a network. The mail gateway generates and manages an identifier each in correspondence with a file attached to an e-mail message addressed to a user. The program comprises: an ID list acquiring step of  
20 acquiring from the mail gateway a list of identifier each of which corresponds to an attached file; a preparing step of preparing the e-mail message by attaching, as a substitute for the originally attached file, an identifier selected by the user from the identifier list acquired in the ID list acquiring step; and a transmitting step  
25 of transmitting to the mail gateway the e-mail message prepared in the preparing step.

[0119]

With this construction, the computer readable recording medium storing a program for providing an interface between the mail terminal and the mail server achieves the following effects. That is, by executing the program on general hardware such as computers, the hardware, when using files attached to a received e-mail message, by attaching to an e-mail message attached IDs corresponding to the attached files desired to be forwarded to another address, the e-mail message is received at a destination terminal together with the desired attached files.

10 [0120]

In the e-mail transmission/reception system according to the present invention, the mail terminal further comprises a share-notifying unit operable to notify the mail gateway that the file attached to the e-mail message addressed to the user of the mail terminal is to be shared with other users. The mail gateway further comprises: an attached file sharing unit operable, in response to the notification from the share-notifying unit, to perform processing so that the attached file held by the mail holding unit is shared with said other users; and a shared-ID generating unit operable to generate a shared identifier in correspondence with the attached file that is made shared by the attached file sharing unit. The shared identifier is available for the users who share the attached file. The share-notifying unit includes: a share-user designating subunit operable to designate, for each attached file, a user to share the attached file; and a share-file designating subunit operable to designate an attached file to be shared. The attached file sharing unit performs the processing so that, of attached files

transmitted to said other users, only the attached file designated by the share-file designating subunit is shared with the users designated by the share-user designating subunit. The notifying unit further notifies the users who share the shared attached file of a list of shared-identifier each of which is generated by the shared-ID generating unit in correspondence with a shared file. The attached file acquiring unit further acquires an attached file corresponding to the shared identifier. The ID list acquiring unit further acquires the shared-ID list showing the shared identifier each corresponding to a file that the user of the mail terminal shares.

[0121]

With this construction, the e-mail transmission/reception system according to the present invention further achieves the following effects in addition to the above-stated effects. That is, files attached to an e-mail message addressed to another user can be used among sharers of the attached files. Therefore, attached files received from the other user can also be attached to and transmitted with a newly prepared e-mail message.

## [BRIEF DESCRIPTION OF THE DRAWINGS]

Fig. 1 is a block diagram showing the construction of the e-mail transmission/reception system including a mail terminal, a mail gateway, and a mail server.

Fig. 2 shows a data structure of received e-mail with an attached file that the mail server receives.

Fig. 3 is a flowchart showing a procedure for forwarding the received mail by the mail terminal.

Fig. 4 shows a sequence for acquiring an attached ID corresponding to each of the attached files included in the received mail.

Fig. 5(a) shows a structure of a list of attached files, and  
5 Fig. 5(b) shows a structure of a list of IDs.

Fig. 6 is a correspondence table between attached files and attached IDs in the case that the message ID of the received mail is set at "0123456789".

Fig. 7 is a flowchart showing a procedure for describing an  
10 attached ID that the ID acquisition unit acquires in the forwarded mail made from the received mail.

Fig. 8 shows a state where the mail preparation unit prepares the forwarded mail from the received mail.

Fig. 9 shows an example of a data structure of the forwarded  
15 mail prepared by the mail preparation unit.

Fig. 10 shows a sequence for sending the forwarded mail prepared from the received mail by the mail preparation to the forwarding address.

Fig. 11 is a flowchart showing a procedure for constructing  
20 the forwarded mail sent from the mail terminal by the mail gateway.

Fig. 12 shows a data structure of the mail constructed from the forwarded mail by the mail gateway.

Fig. 13 is a block diagram showing the construction of the e-mail transmission/reception system including a mail terminal, a  
25 mail gateway, and a mail server.

Fig. 14 is a flowchart showing a procedure for converting an attached file for each of the receivers' addresses and a procedure

for constructing the converted attached file for each of the receivers' addresses by the mail gateway.

Fig. 15 shows a data structure of the mail sent from the mail terminal.

5        Fig. 16 is an example of a table indicating information on file format conversion stored in the file format storing unit.

Figs. 17(a), 17(b), and 17(c) show a data structure of the mail constructed for each of the receivers' addresses.

10       Fig. 18 is a block diagram showing the construction of the e-mail transmission/reception system including a mail terminal, a mail gateway, and a mail server.

Fig. 19 shows an example of a data structure of the mail prepared by the mail preparation unit.

15       Figs. 20(a) and 20(b) show examples of a data structure of the mail constructed for each of the receivers' addresses.

Fig. 21 is a block diagram showing the construction of the e-mail transmission/reception system including a mail terminal, a mail gateway, and a mail server.

20       Fig. 22 is a correspondence table consisting of "shared IDs", "attached IDs", and "sharers", in which the table is stored in the ID storing unit.

Fig. 23 is a flowchart showing a procedure for sharing the attached file belonging to a user of a mail terminal with the other users.

25       Fig. 24 is a flowchart showing a procedure for the mail gateway to construct the mail including the shared ID sent from the mail terminal.

[DESCRIPTION OF CHARACTERS]

	100	mail terminal
	101	ID acquisition unit
5	102	mail preparation unit
	103	mail sending unit
	110	mail gateway
	111	ID storing unit
	112	mail acquisition unit
10	113	mail construction unit
	114	mail reception unit
	115	mail sending unit
	120	mail server
	121	mail management unit
15	122	mail spool
	123	mail distribution unit

[DOCUMENT] Abstract

[SUMMARY]

[AIM] To provide an e-mail transmission/reception system capable of selecting, from among a plurality of files attached to a received e-mail message, only files desired to be forwarded to another address, and forwarding an e-mail message to the address without actually attaching the selected attached files, whereby the e-mail message is received at the address together with the selected attached files.

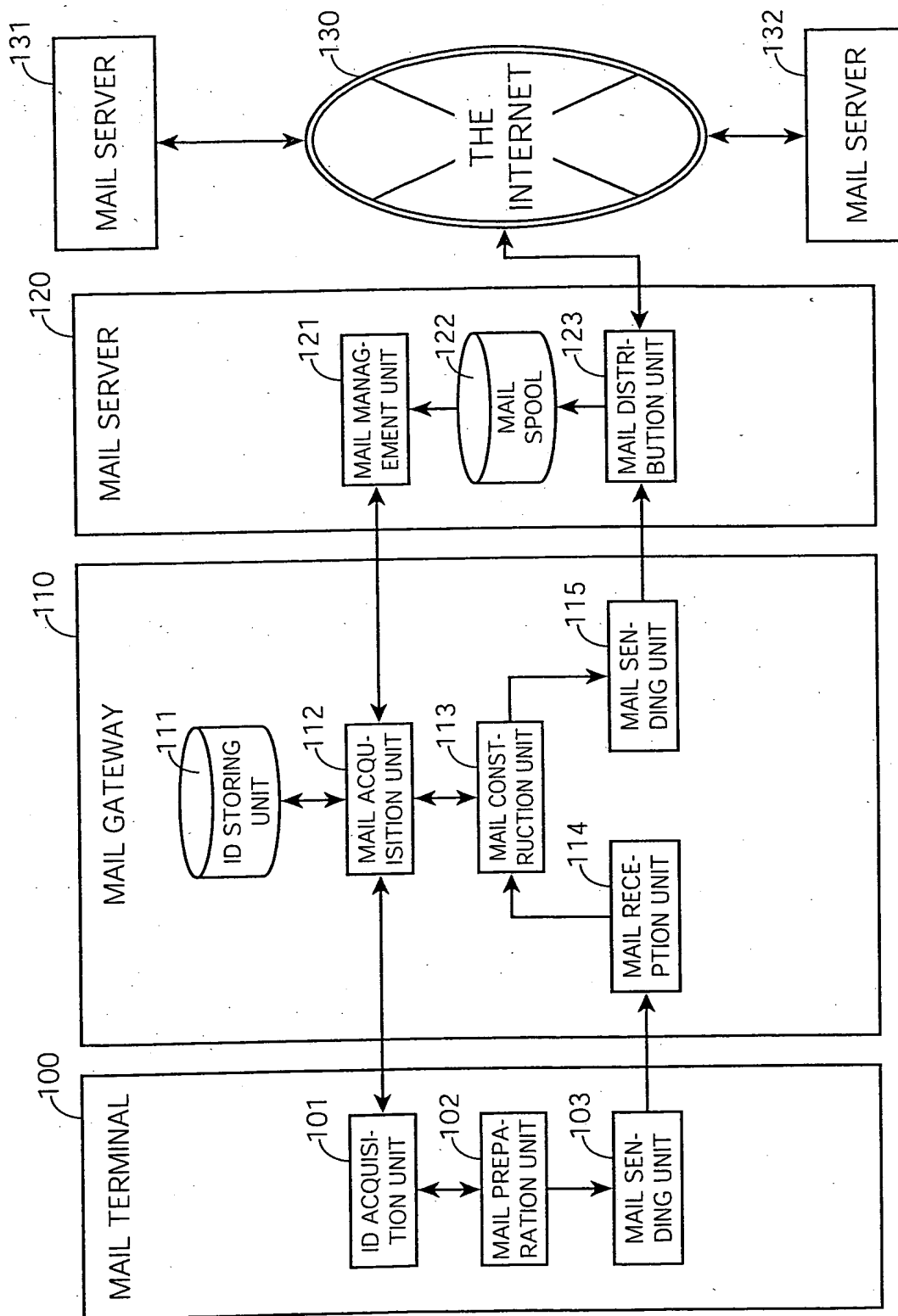
10 [MEANS TO ACHIEVE THE AIM]

A mail gateway 110 assigns IDs to files attached to an e-mail message that has been received and held in a mail server 120, and notifies a mail terminal of a list of the assigned IDs. The mail gateway 110 is composed of an ID list storing unit 111 for storing the list of the assigned IDs, a mail acquisition unit 112 for acquiring an attached file corresponding to an ID, a mail construction unit 113 for constructing an e-mail message to be transmitted by attaching an ID received from the mail acquisition unit 112, a mail reception unit 114, and a mail sending unit 115.

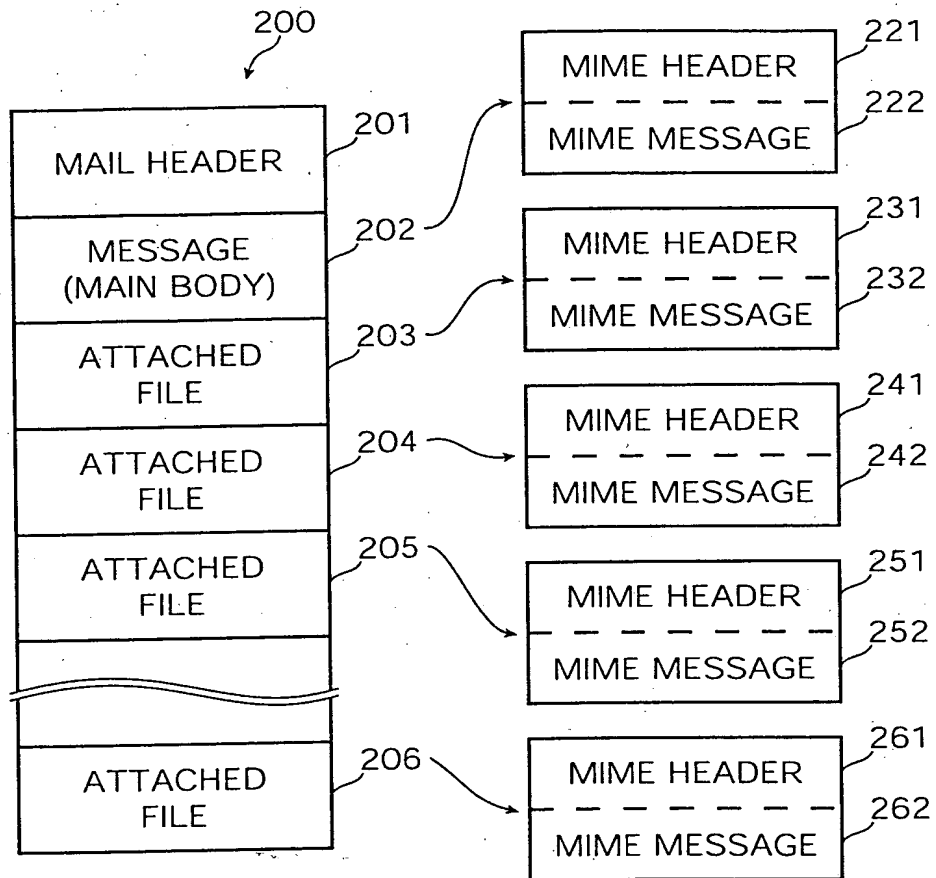
20

[SELECTED FIGURE] FIG.1

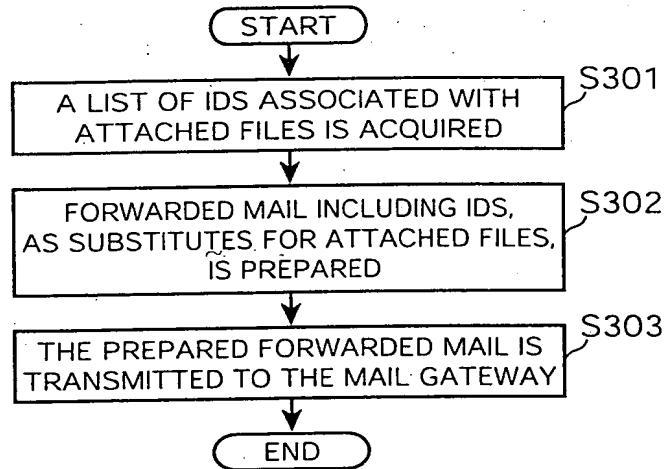




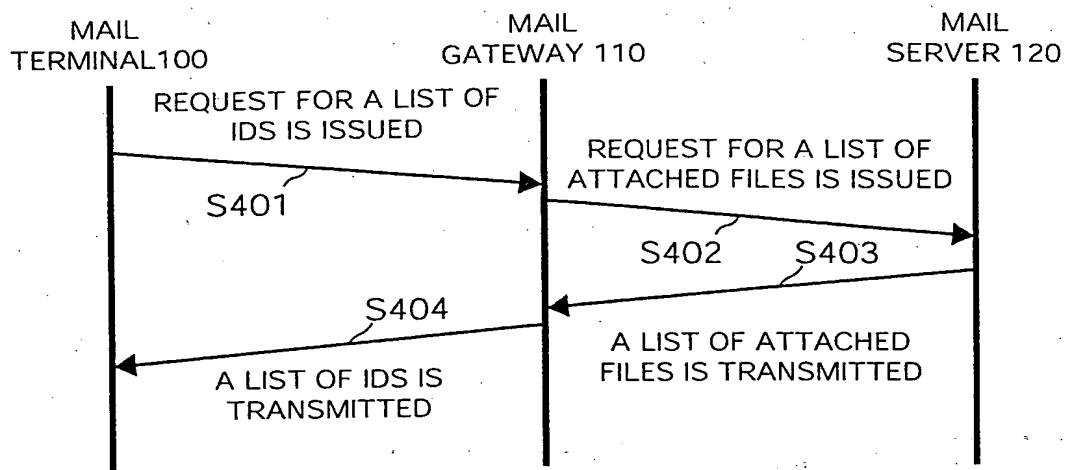
[Fig. 2]



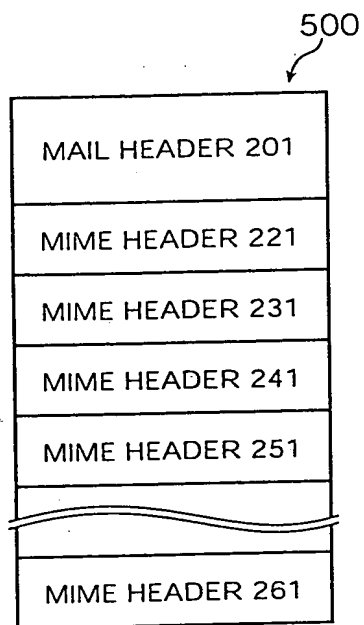
[Fig. 3]



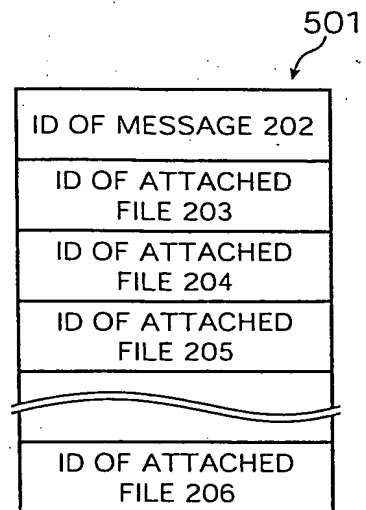
[Fig. 4]



[Fig. 5]



(a)

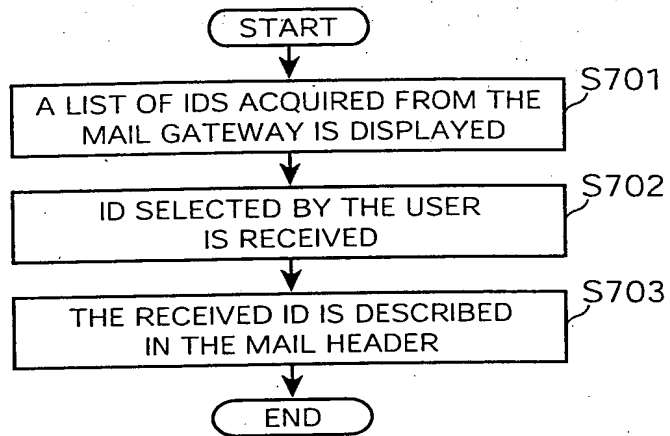


(b)

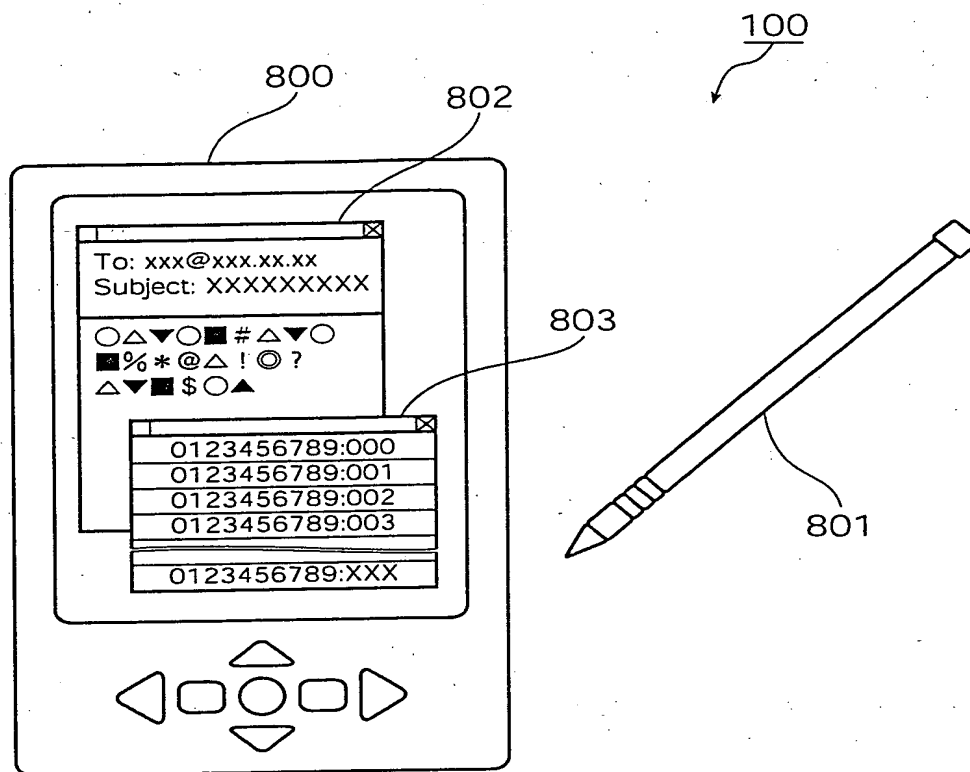
[Fig. 6]

ATTACHED FILE	ATTACHED ID
MESSAGE 202	0123456789:000
ATTACHED FILE 203	0123456789:001
ATTACHED FILE 204	0123456789:002
ATTACHED FILE 205	0123456789:003
ATTACHED FILE 206	0123456789:XXX

[Fig. 7]

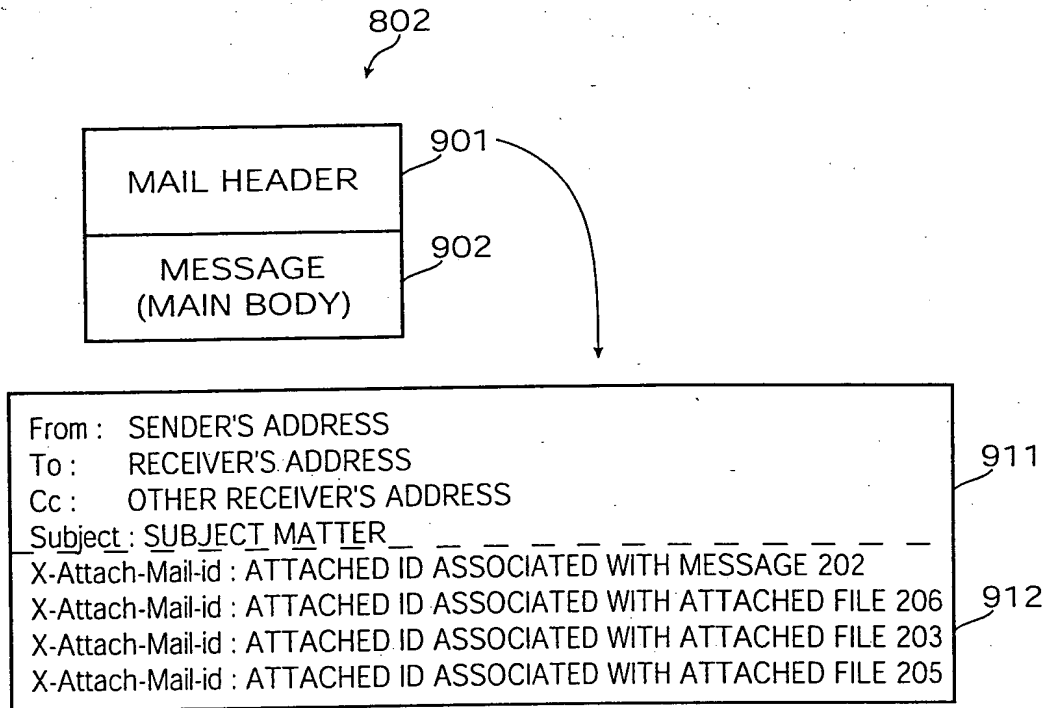


[Fig. 8]

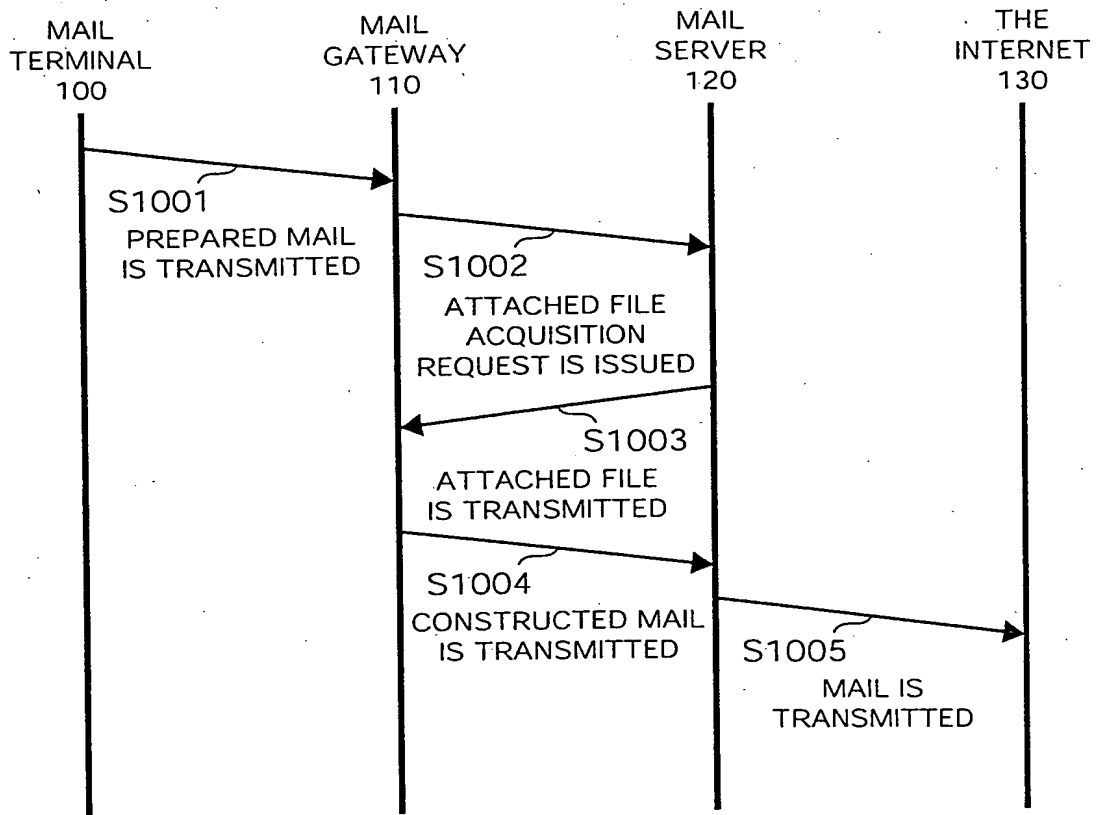




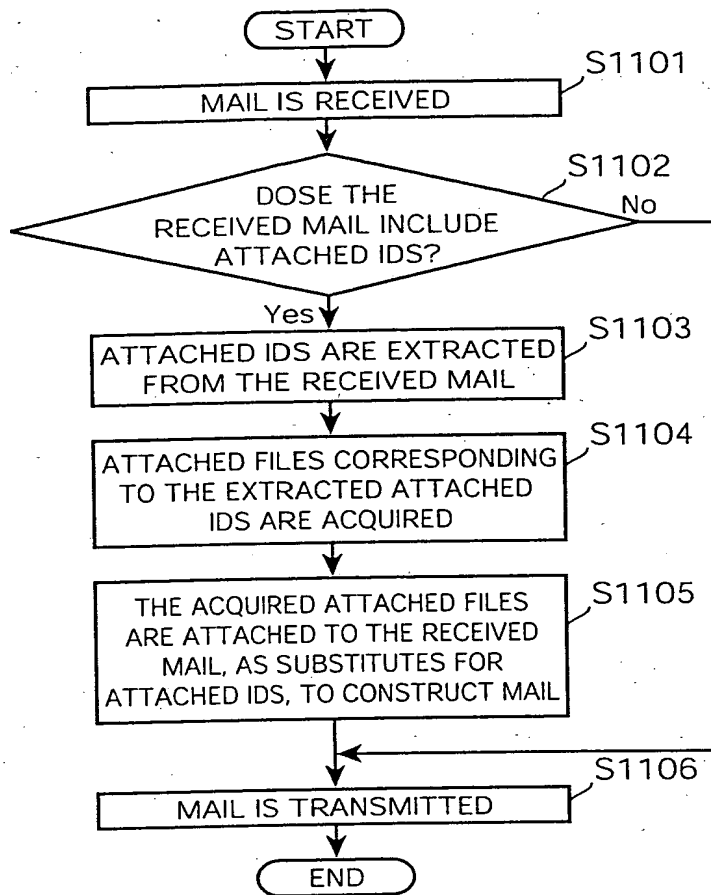
[Fig. 9]



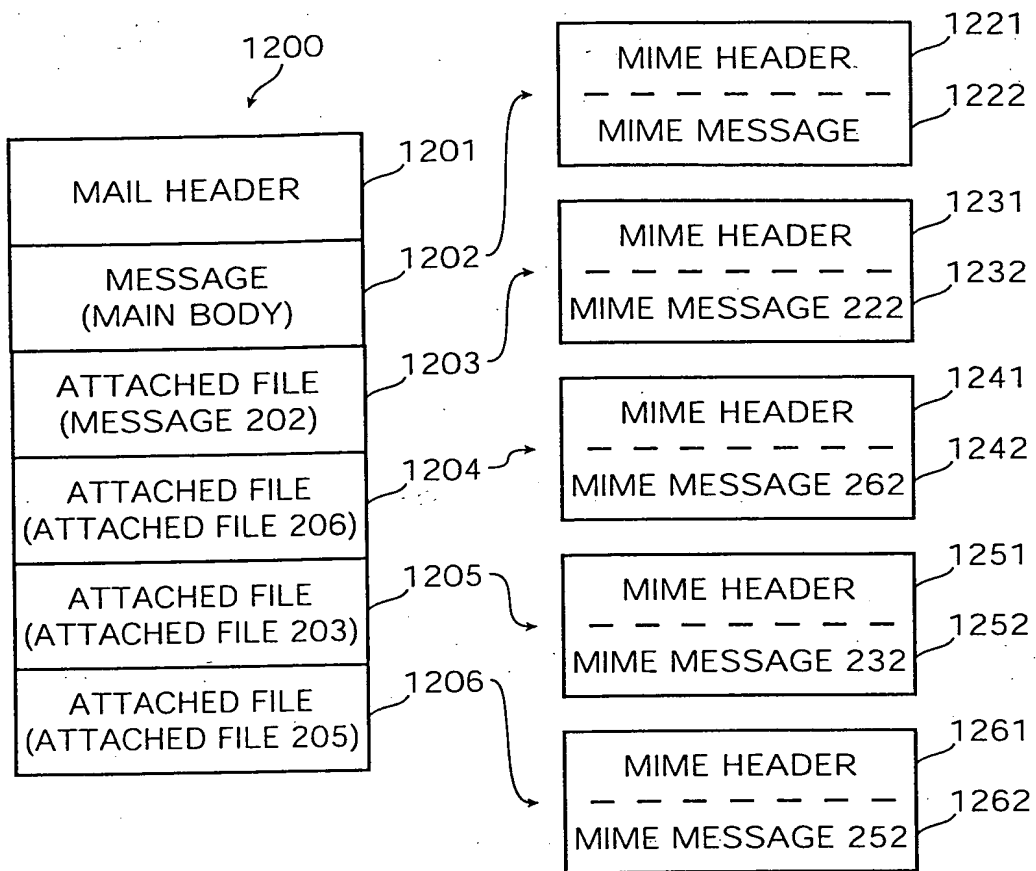
[Fig. 10]



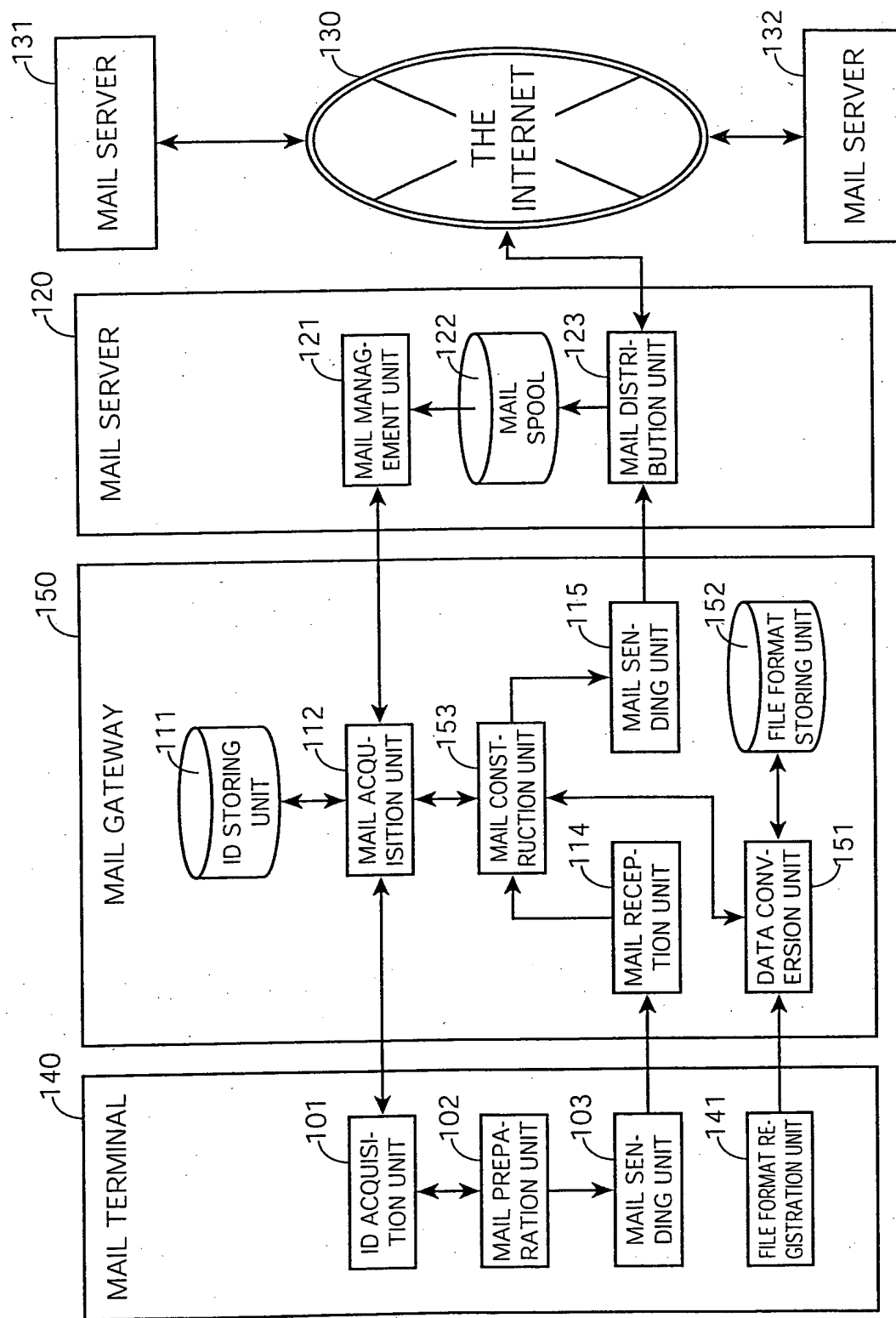
[Fig. 11]



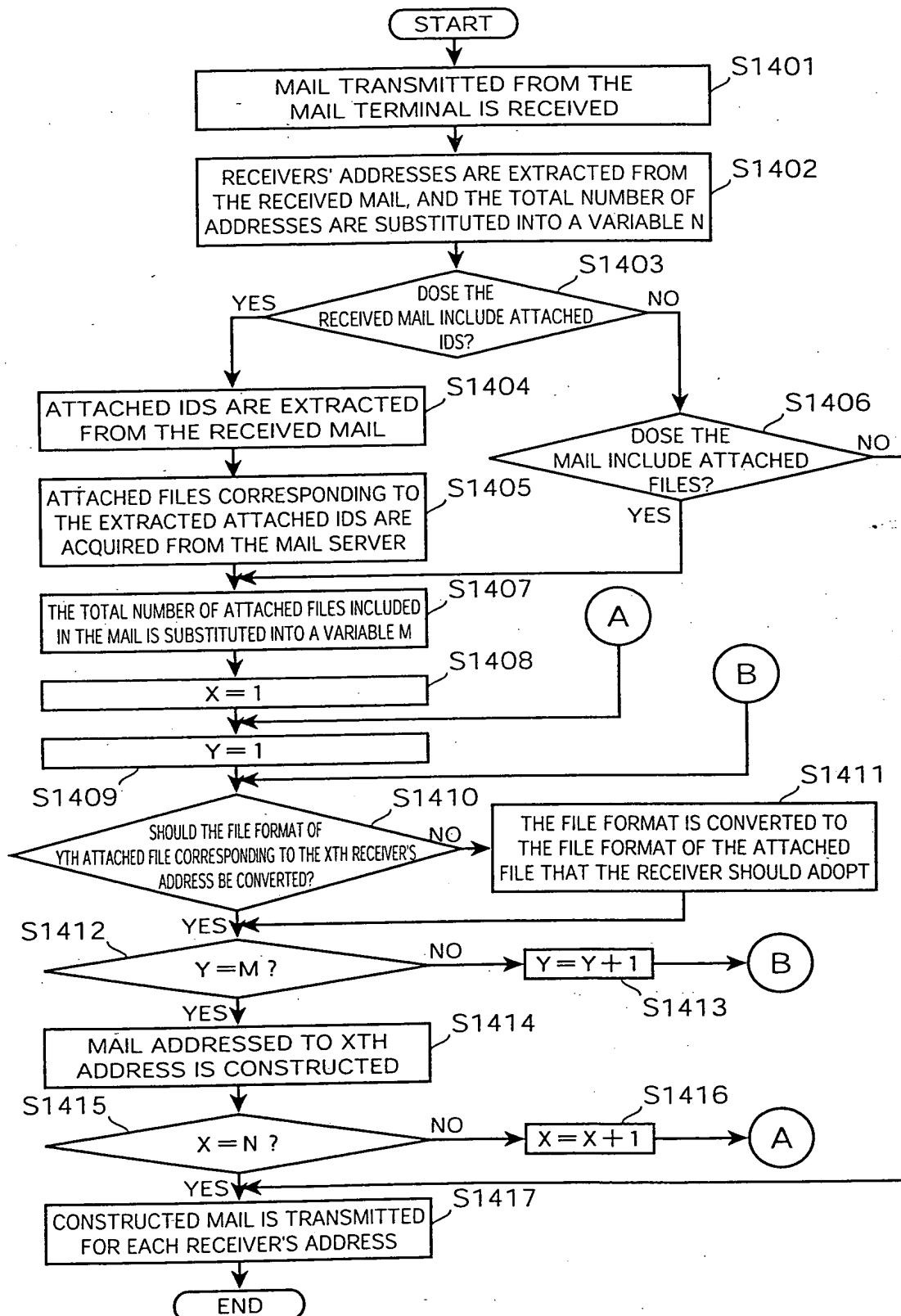
[Fig. 12]



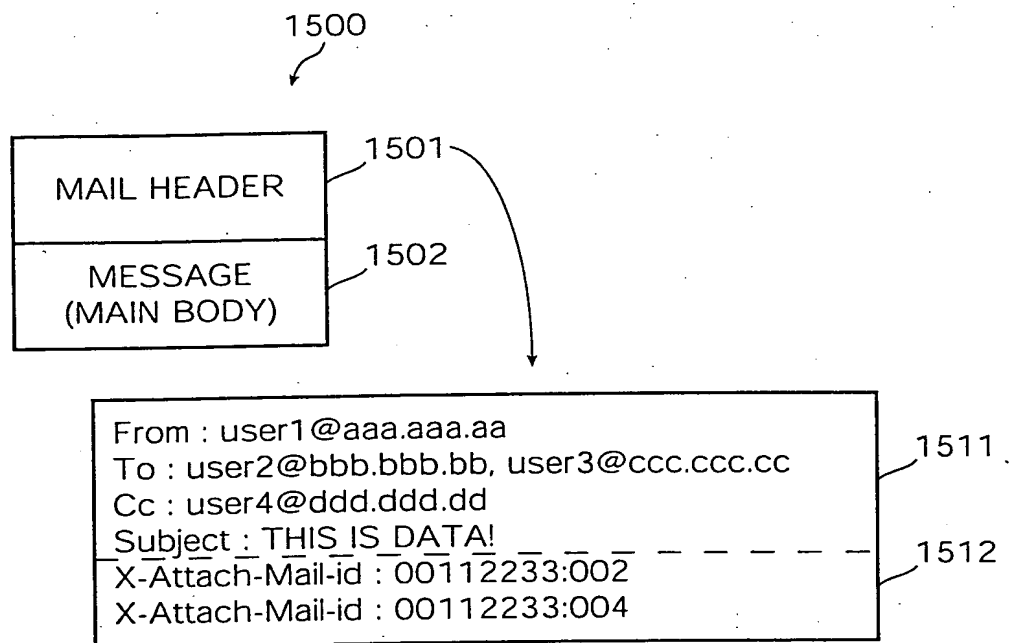
[Fig. 13]



[Fig. 14]



[Fig. 15]



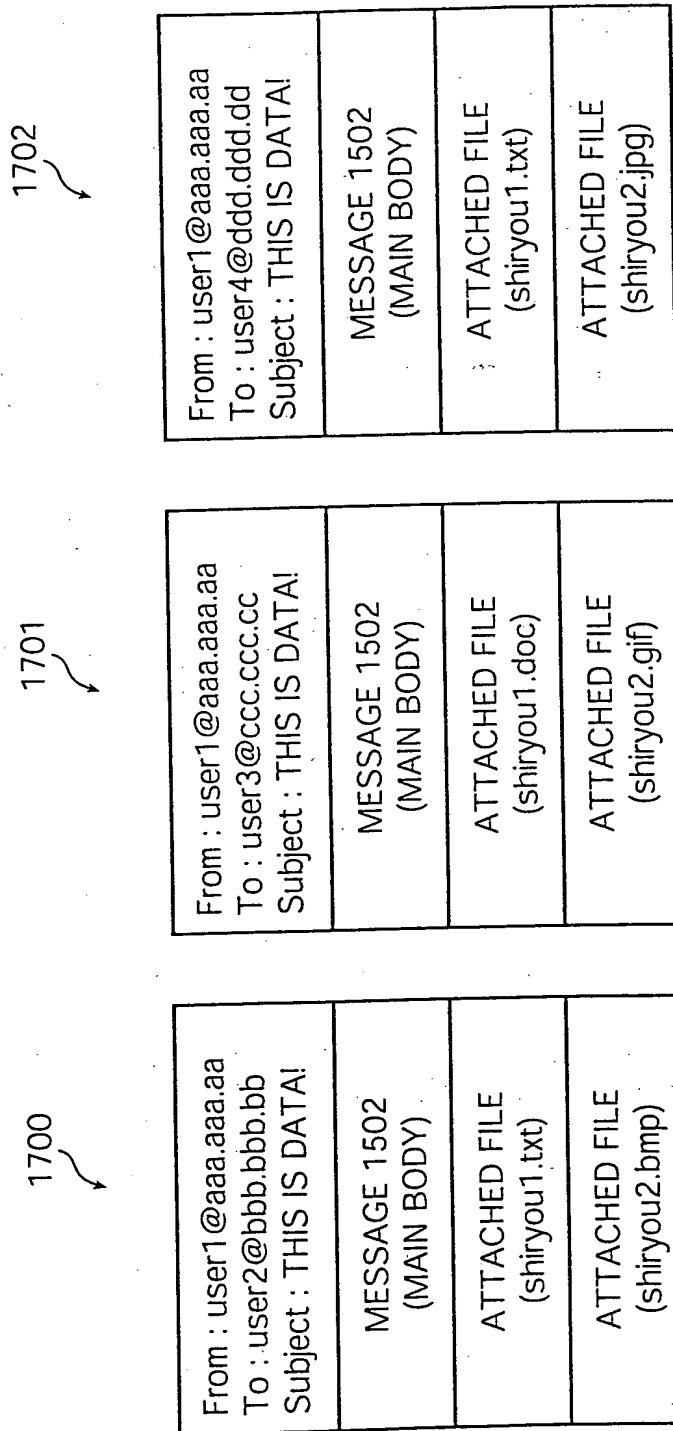
[Fig. 16]

1600

RECEIVER'S ADDRESS	FILE FORMAT OF ATTACHED FILE THAT RECEIVER SHOULD ADOPT
user1@aaa.aaa.aa	doc, bmp, jpg
user2@bbb.bbb.bb	txt, bmp
user3@ccc.ccc.cc	doc, gif
user4@ddd.ddd.dd	txt, jpg
user5@eee.eee.ee	doc, txt, bmp, jpg



[Fig. 17]

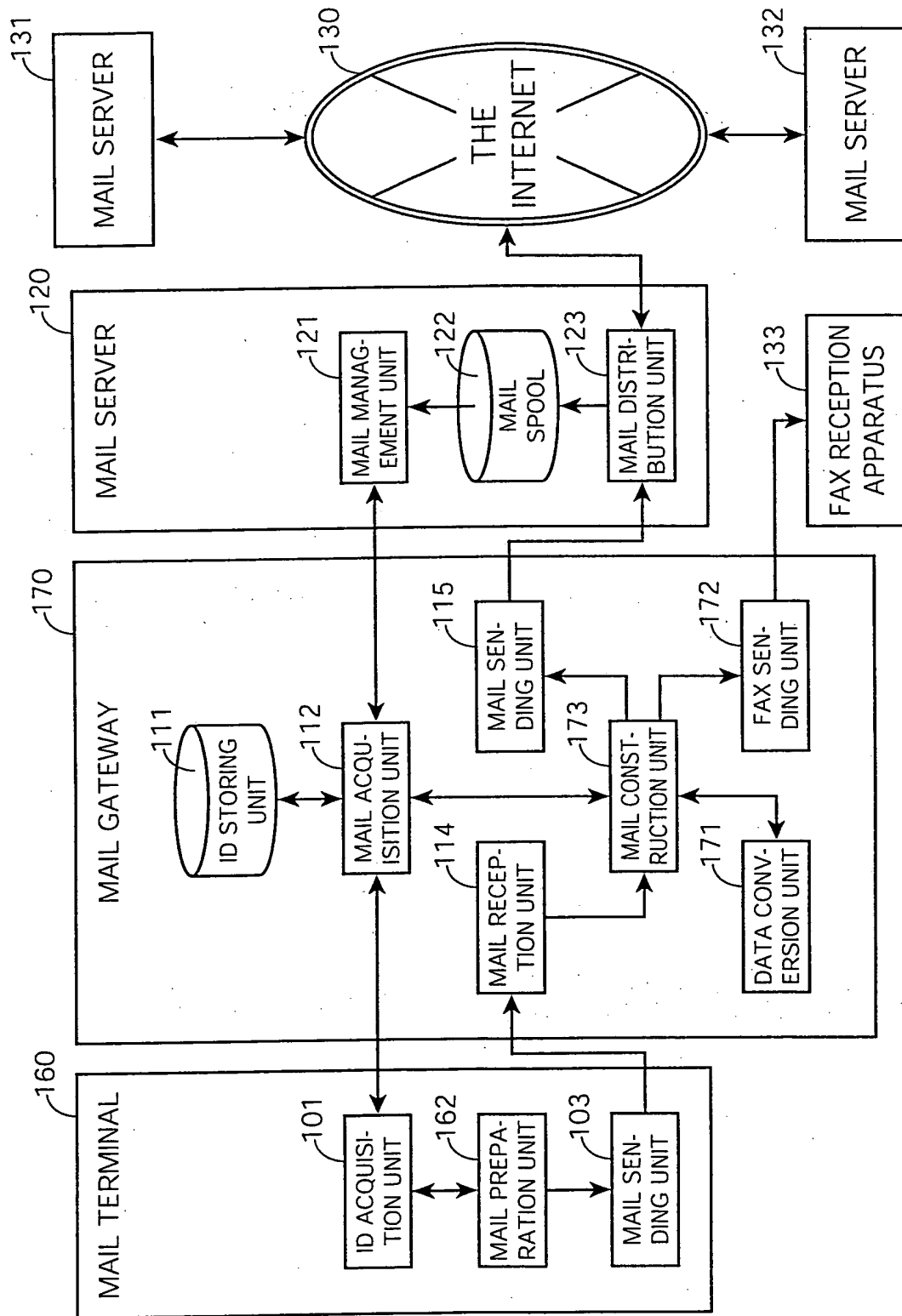


(a)

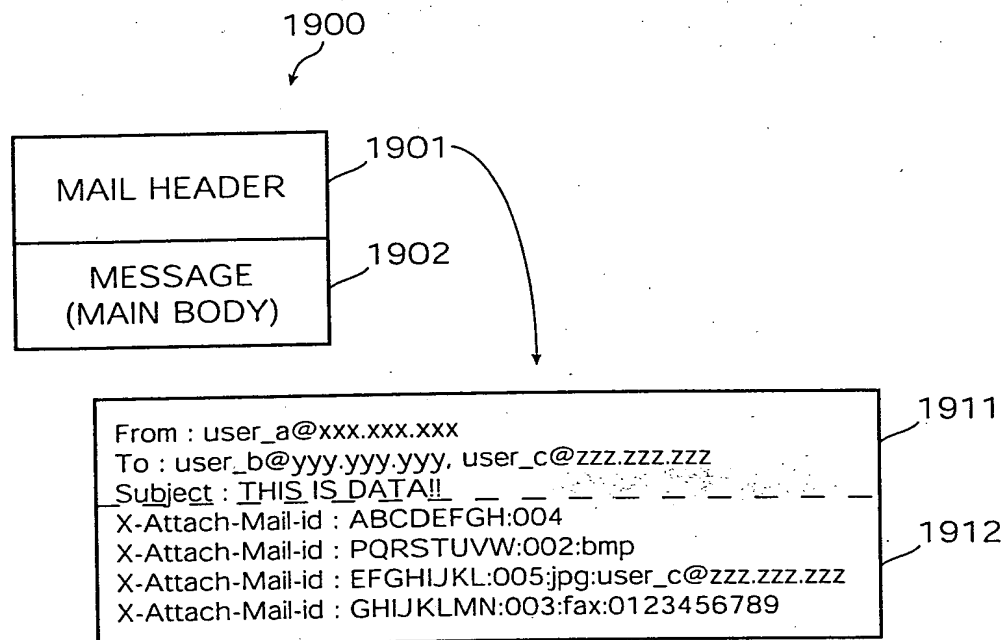
(b)

(c)

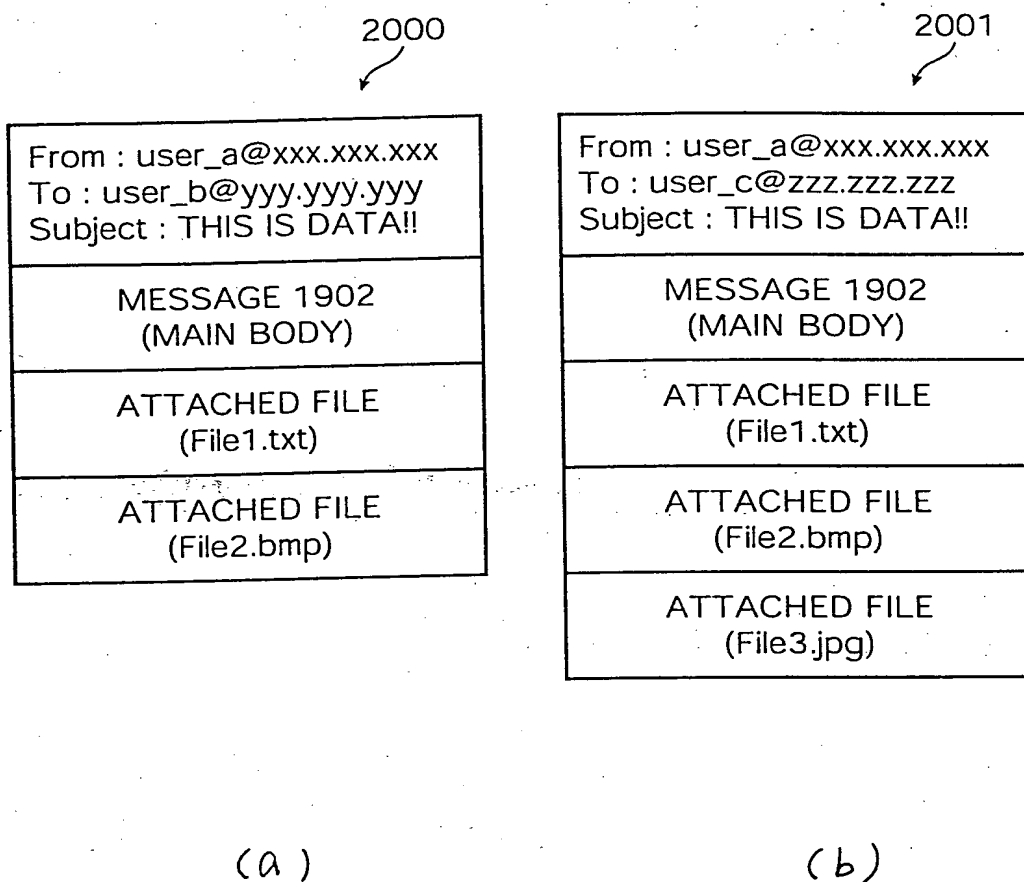
[Fig. 18]



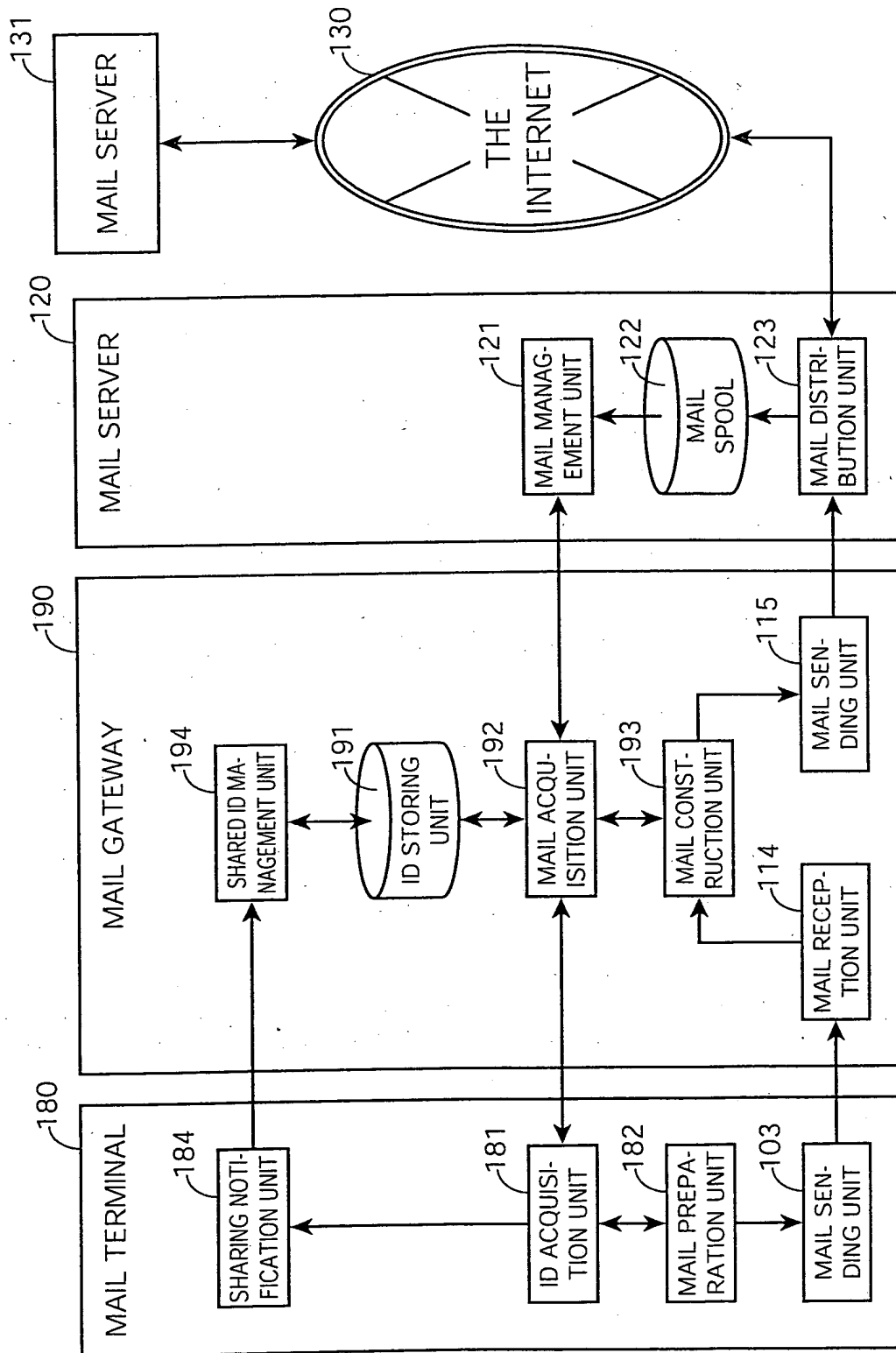
[Fig. 19]



[Fig. 20]



[Fig. 21]

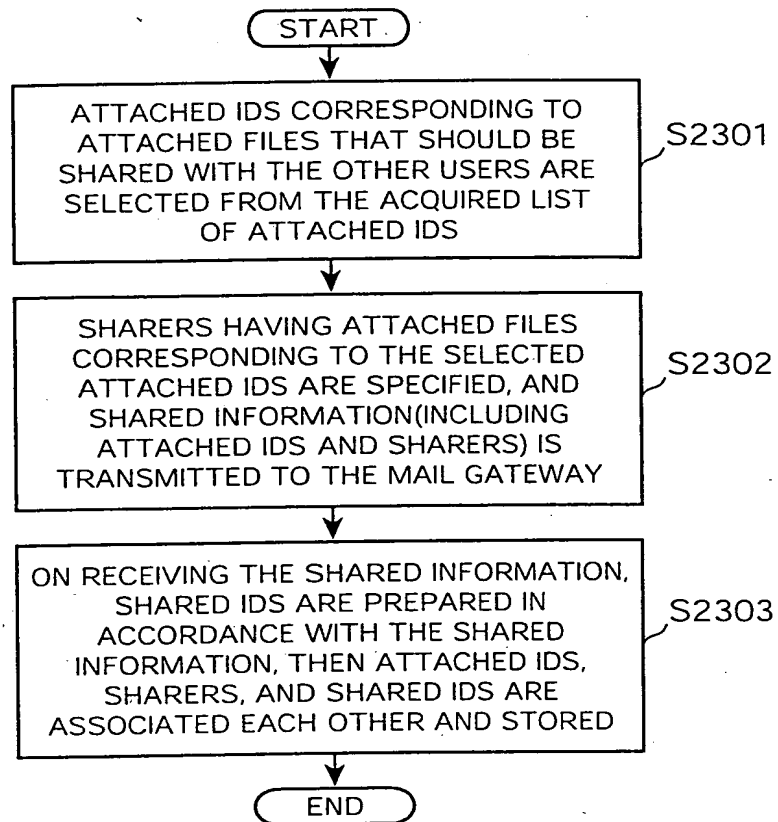


[Fig. 22]

2200

SHARED ID	ATTACHED ID	SHARER
ZXFG743211	GYF93501:001	user24, user6, user109
TYJI94890F	A23BG968:003	user9
A8745HDW30	C67J9DF7:005	user53, user65, user9, user21
KRS73209L4	RD90K574:002	user5, user9
JJD5409M82	XUH7J6F1:004	user10, user11, user12

[Fig. 23]



[Fig. 24]

